

TECHNICAL MANUAL
OPERATIONS INSTRUCTIONS
RADAR PRODUCT GENERATOR (RPG)

DOPPLER METEOROLOGICAL RADAR
WSR-88D



OFFICE OF PRIMARY RESPONSIBILITY:
NATIONAL WEATHER SERVICE RADAR OPERATIONS CENTER

This revision supercedes NWS EHB 6-526 (AF TO 31P1-4-108-451-1; FAA TI 6345.1 V50)
dated 29 MARCH 2004 and subsequent change:
CHANGE 1 dated 30 April 2004

Distribution Statement A - Approved for public release; distribution is unlimited.

PUBLISHED UNDER AUTHORITY OF THE SECRETARIES OF
COMMERCE, THE AIR FORCE, AND TRANSPORTATION

30 SEPTEMBER 2004

LIST OF EFFECTIVE PAGES**INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.**

NOTE: The portion of the text affected by the changes are indicated by a vertical line in the outer margins of the page.

Dates of issue for original and changed pages.

Original 0 30 September 2004

TOTAL NUMBER OF PAGES IN THIS MANUAL ARE 420 CONSISTING OF THE FOLLOWING

Page No.	*Change No.
Cover Page	0
Title Page	0
A.	0
i - xxix	0
xxx Blank	0
1-1 - 1-20	0
2-1 - 2-246	0
3-1 - 3-75	0
3-76 Blank	0
A-1 - A-26	0
Index-1 - Index-13	0
Index-14 Blank	0
Glossary-1 - Glossary-4	0

*Zero in this column indicates an original page.

TABLE OF CONTENTS

Paragraph	Page
LIST OF ILLUSTRATIONS	xxi
LIST OF TABLES	xxv
FOREWORD	xxvi
SAFETY SUMMARY	xxviii
CHAPTER 1 GENERAL INFORMATION.....	1-1
SECTION 1.1. INTRODUCTION	1-1
1.1.1 Purpose of Manual.	1-1
1.1.2 Contents of Manual.	1-1
1.1.3 Scope of Manual.	1-2
SECTION 1.2. CHAPTER CONTENTS	1-3
SECTION 1.3. HARDWARE FUNCTIONALITY	1-4
1.3.1 RPG Functionality.	1-4
1.3.1.1 RPG Processor	1-4
1.3.1.2 Local Area Network (LAN) Switch	1-4
1.3.1.3 Power Administrator Masterswitch	1-4
1.3.1.4 Uninterruptible Power Supply (UPS)	1-4
1.3.1.5 Base Data Distribution Server (BDDS)	1-5
1.3.1.6 RDA/RPG Gateway	1-5
1.3.1.7 Communication Server	1-5
1.3.1.8 RPG Router	1-5
1.3.1.9 Dedicated/Dial Modem Rack Assembly	1-5
1.3.1.10 Storage Device	1-5
1.3.1.11 Keyboard, Video, Mouse (KVM) Switch	1-5
1.3.1.12 17-Inch Monitor	1-5
1.3.1.13 Keyboard and Mouse	1-5
1.3.1.14 Short-Haul Modem	1-6
1.3.1.15 Dial Patch Panel	1-6
1.3.1.16 Dial Adapter Panel	1-6
1.3.1.17 Dedicated Adapter Panel	1-6
1.3.1.18 Dedicated Patch Panels	1-6
1.3.1.19 Channel Service Unit (CSU) (NWS only)	1-6
1.3.2 Wideband Communications.	1-6
1.3.3 Narrowband Communications.	1-6
1.3.4 Redundant Systems.	1-7
1.3.4.1 NWS Redundant System	1-7
1.3.4.1.1 Remote RDA Maintenance Terminal	1-7

TABLE OF CONTENTS

Paragraph		Page
1.3.4.2	FAA Redundant System	1-7
1.3.4.2.1	FAA Remote Monitoring Subsystem (RMS)	1-7
1.3.4.2.2	Remote Monitoring Subsystem (RMS) Power Administrator	1-7
1.3.4.2.3	Relay Box	1-7
1.3.5	Master System Control Function (MSCF) Equipment UD71.	1-8
1.3.5.1	Local MSCF	1-8
1.3.5.2	Distant MSCF	1-8
1.3.6	Printer.	1-9
SECTION 1.4.	SPECIFIC HARDWARE DESCRIPTION	1-10
1.4.1	RPG Equipment Description.	1-10
1.4.2	RPGPCA UD70.	1-13
1.4.2.1	RPG Processor	1-13
1.4.2.2	LAN Switch	1-13
1.4.2.3	Power Administrator Masterswitch	1-13
1.4.2.4	UPS	1-13
1.4.2.5	BDDS	1-14
1.4.2.6	Communication Server	1-14
1.4.2.7	Router	1-14
1.4.2.8	Narrowband Communications Equipment	1-14
1.4.2.9	Storage Device	1-14
1.4.2.10	Channel Service Unit (CSU) (NWS only)	1-14
1.4.3	MSCF Equipment.	1-15
1.4.3.1	MSCF Terminal Suite	1-15
1.4.3.2	DoD and FAA MSCF Communications	1-15
1.4.3.3	NWS Communications	1-15
1.4.4	FAA Unique Hardware.	1-15
1.4.4.1	RMS Power Administrators	1-16
1.4.4.2	Relay Box	1-16
1.4.5	NWS Unique Hardware - Remote RDA Maintenance Terminal (UD32). ...	1-16
SECTION 1.5.	SOFTWARE DESCRIPTION	1-18
1.5.1	RPG Group Software.	1-18
1.5.2	UNIX Operating System.	1-18
1.5.3	RPG Software Program (CPCI 03).	1-18
1.5.3.1	Acquire Radar Data	1-19
1.5.3.2	Acquire Gauge-Radar Bias Table Data	1-19
1.5.3.3	Generate Products	1-19
1.5.3.4	Distribute Products	1-19
1.5.3.5	Control System	1-19
1.5.3.6	CPCI 03 Interface Requirements	1-19
1.5.3.6.1	Hardware Interfaces	1-19
1.5.3.6.2	Operational Computer Program Interfaces	1-19

TABLE OF CONTENTS

Paragraph		Page
SECTION 1.6.	CONSUMABLES/EXPENDABLES	1-20
CHAPTER 2	OPERATIONS	2-1
SECTION 2.1.	INTRODUCTION	2-1
2.1.1	General.	2-1
2.1.2	Chapter Organization.	2-1
SECTION 2.2.	MASTER SYSTEM CONTROL FUNCTION	2-2
2.2.1	Introduction.	2-2
2.2.2	MSCF Configurations.	2-2
2.2.2.1	Local MSCF	2-2
2.2.2.2	Distant MSCF	2-2
2.2.3	Display.	2-2
2.2.3.1	Common Desktop Environment (CDE)	2-3
2.2.3.1.1	Windows	2-3
2.2.3.1.2	Workspaces	2-3
2.2.3.1.3	Controls	2-3
2.2.3.1.4	Menus	2-3
2.2.3.1.5	Front Panel	2-3
2.2.4	Graphical RPG Applications Software.	2-7
2.2.4.1	RPG Human-Computer Interface (HCI) Controls	2-7
2.2.4.1.1	Windows	2-9
2.2.4.1.2	Icons	2-10
2.2.4.1.3	Buttons	2-10
2.2.4.1.3.1	Sensitized Buttons	2-10
2.2.4.1.3.2	Desensitized Buttons	2-11
2.2.4.1.4	Indicators	2-11
2.2.4.1.5	Color-coding	2-11
2.2.4.1.6	Warning Popups	2-11
2.2.4.1.7	Password Window	2-12
2.2.4.1.8	Controls	2-14
2.2.4.1.9	Workspace Menu	2-17
2.2.5	Keyboard Usage.	2-18
2.2.5.1	Alphanumeric Keys	2-19
2.2.5.2	Space Bar	2-19
2.2.5.3	Return Key	2-20
2.2.5.4	Cursor Control Keys	2-20
2.2.5.4.1	Cursor Movement Keys	2-20
2.2.5.4.2	Tab Key	2-20
2.2.5.4.3	Home Key	2-20
2.2.5.4.4	Page Up/Page Down Keys	2-20
2.2.5.4.5	Back Space Key	2-21

TABLE OF CONTENTS

Paragraph		Page
2.2.5.5	Insert Key	2-21
2.2.5.6	Delete Key	2-21
2.2.5.7	Numeric Keypad	2-21
2.2.5.8	Shift Keys	2-21
2.2.5.9	Capital Lock	2-21
2.2.5.10	Power On/Off Key	2-21
2.2.6	Mouse.	2-22
2.2.6.1	Left Mouse Button	2-22
2.2.6.2	Middle Mouse Button	2-24
2.2.6.3	Right Mouse Button	2-24
2.2.6.4	Keystroke Alternatives to Mouse Buttons	2-24
2.2.7	MSCF Window.	2-24
2.2.7.1	Close Button	2-26
2.2.7.2	Comms Status Button	2-26
2.2.7.2.1	Comms Status Window	2-28
2.2.7.2.1.1	CISCO Switch	2-28
2.2.7.2.1.2	CISCO Router	2-30
2.2.7.2.1.3	Router Card Status	2-32
2.2.7.2.2	Update Button	2-34
2.2.7.3	Power Control Button	2-34
2.2.7.3.1	Power Control - Turn Off	2-34
2.2.7.3.2	Power Control - Turn On	2-35
2.2.7.3.3	Power Control - Reboot	2-35
2.2.7.4	RPG HCI	2-35
2.2.7.5	RDA HCI	2-36
2.2.7.6	BDDS HCI	2-36
2.2.7.6.1	Archive Level II LDM Control	2-36
2.2.7.6.2	Base Data Client Control	2-36
2.2.7.6.2.1	Start	2-36
2.2.7.6.2.2	Stop	2-36
2.2.7.6.2.3	Update Info	2-37
2.2.7.6.2.4	Terminate Clients	2-37
2.2.7.6.3	Assign New Clients	2-37
2.2.7.7	FAA Redundant	2-37
2.2.7.8	Hardware Status/Warnings Window	2-39
2.2.7.9	Show Pull Down Menu	2-39
2.2.7.10	Search	2-39
2.2.7.11	Lines	2-39
2.2.7.12	Find	2-40
2.2.7.13	Clear Button	2-40
2.2.7.14	Network Connectivity	2-40

TABLE OF CONTENTS

Paragraph		Page
SECTION 2.3.	HUMAN COMPUTER INTERFACE (HCI)	2-41
2.3.1	RDA Icon and Graphical Display of RDA.	2-42
2.3.2	RDA Power Source.	2-43
2.3.3	Radome.	2-43
2.3.4	Tower.	2-44
2.3.5	Transition Power Source (TPS).	2-44
2.3.6	Displayed Elevation Angle and Current VCP.	2-44
2.3.6.1	VCP Control Window	2-45
2.3.6.1.1	Close Button	2-45
2.3.6.1.2	Auto PRF Function	2-45
2.3.6.1.3	CHANGE to RDA VCP	2-46
2.3.6.1.4	DOWNLOAD VCP from RPG	2-46
2.3.6.1.5	Modify VCP	2-47
2.3.6.1.5.1	PRF Selection (Modify Current VCP) Window	2-49
2.3.6.1.5.1.1	Control Section	2-49
2.3.6.1.5.1.1.1	Close Button	2-49
2.3.6.1.5.1.1.2	Save Button	2-49
2.3.6.1.5.1.1.3	Undo Button	2-49
2.3.6.1.5.1.1.4	Download Button	2-49
2.3.6.1.5.1.1.5	Refresh Button	2-50
2.3.6.1.5.1.1.6	Velocity Increment Buttons	2-50
2.3.6.1.5.1.1.7	Modify Elevation Range Buttons	2-50
2.3.6.1.5.1.2	Obscuration Table Section	2-50
2.3.6.1.5.1.3	Graphical Display Section	2-51
2.3.6.1.5.1.4	Modify Current VCP Data Window	2-53
2.3.6.1.5.1.4.1	Close Button	2-53
2.3.6.1.5.1.4.2	Undo Button	2-53
2.3.6.1.5.1.4.3	Show Buttons	2-53
2.3.6.1.5.1.4.4	Velocity Increment Buttons	2-53
2.3.6.1.5.1.4.5	Current VCP Table	2-53
2.3.6.1.5.2	Modify VCP Adaptation Data Window	2-54
2.3.6.1.6	Restart VCP	2-58
2.3.6.1.7	Restart Elevation	2-58
2.3.7	RDA Alarm Summary.	2-58
2.3.8	MLOS Control Window.	2-59
2.3.8.1	MLOS Status Window	2-59
2.3.8.1.1	FAS P16 Check Buttons	2-59
2.3.8.1.2	Configuration/Messages Section	2-59
2.3.8.1.3	Alarm Channel Status Section	2-60
2.3.9	RDA Control Indicator.	2-61
2.3.10	RDA Icon.	2-61
2.3.10.1	RDA Control/Status Window	2-61
2.3.10.1.1	Close Button	2-63

TABLE OF CONTENTS

Paragraph		Page
2.3.10.1.2	Get Status Button	2-63
2.3.10.1.3	RDA Alarms Button	2-63
2.3.10.1.4	Moments Button	2-63
2.3.10.1.5	VCP Button	2-64
2.3.10.1.6	RDA State	2-65
2.3.10.1.6.1	RDA Standby	2-66
2.3.10.1.6.2	RDA Restart	2-66
2.3.10.1.6.3	RDA Operate	2-66
2.3.10.1.6.4	RDA Offline Operate	2-67
2.3.10.1.7	RDA Control	2-67
2.3.10.1.7.1	Enable Local (RDA) Button	2-67
2.3.10.1.7.2	Select Remote (RPG) Button	2-67
2.3.10.1.7.3	Control Either	2-68
2.3.10.1.8	RDA Power Source	2-68
2.3.10.1.8.1	Utility Button	2-69
2.3.10.1.8.2	Auxiliary Button	2-69
2.3.10.1.9	Interference Suppression	2-69
2.3.10.1.9.1	Enabled ISU Button	2-70
2.3.10.1.9.2	Disabled ISU Button	2-70
2.3.10.1.10	Calibration	2-70
2.3.10.1.10.1	Automatic Calibration Button	2-71
2.3.10.1.10.2	Manual Calibration Button	2-71
2.3.10.1.11	FAA Redundant Control	2-72
2.3.10.1.11.1	FAA Channel 1	2-72
2.3.10.1.11.2	FAA Channel 2	2-72
2.3.10.1.11.3	FAA Redundant Channel Status and Adapt	2-73
2.3.10.1.12	Additional RDA Status Information	2-73
2.3.10.1.12.1	Operational Mode	2-73
2.3.10.1.12.2	Control Authority	2-74
2.3.10.1.12.3	Transmitter Power	2-74
2.3.10.1.12.4	Calib. Correction	2-74
2.3.10.1.12.5	Interference Rate	2-74
2.3.10.1.12.6	Moments Enabled	2-74
2.3.10.2	RDA Alarms	2-74
2.3.10.2.1	Maximum Displayable Alarms	2-76
2.3.10.2.2	Device	2-76
2.3.10.2.3	Filter Parameters	2-76
2.3.10.2.3.1	MMDDYY Blocks	2-77
2.3.10.2.3.2	HHMMSS Blocks	2-77
2.3.10.2.3.3	Search Block	2-77
2.3.10.2.3.4	Clear Button	2-77
2.3.10.2.4	RDA Alarm Messages Scrolled List	2-77
2.3.11	RDA Power Source Icons.	2-78

TABLE OF CONTENTS

Paragraph		Page
2.3.12	RDA/RPG Interface Status.	2-79
2.3.12.1	RDA/RPG Interface Control/Status Window	2-81
2.3.12.1.1	State Text	2-81
2.3.12.1.2	Wideband Control Buttons	2-82
2.3.12.1.2.1	Wideband Connect Button	2-82
2.3.12.1.2.2	Wideband Disconnect Button	2-82
2.3.12.1.3	Wideband Interface Parameters	2-82
2.3.12.1.3.1	Retries	2-82
2.3.12.1.3.2	Timeouts	2-83
2.3.12.1.3.3	Loopback Rate	2-83
2.3.13	RPG Icon.	2-83
2.3.13.1	RPG Control Window	2-84
2.3.13.1.1	RPG Close, State, and Mode	2-85
2.3.13.1.2	RPG System Control Block	2-85
2.3.13.1.2.1	RPG Restart-All Tasks	2-85
2.3.13.1.2.2	RPG Restart - Options	2-86
2.3.13.1.2.2.1	Activate Button	2-87
2.3.13.1.2.2.2	Initialization Options	2-87
2.3.13.1.2.3	RPG Shutdown	2-88
2.3.13.1.2.4	RPG Shutdown - Standby	2-88
2.3.13.1.2.5	RPG Mode - Operate	2-89
2.3.13.1.2.6	RPG Mode - Test	2-89
2.3.13.1.3	Default Weather Mode	2-89
2.3.13.1.4	Default VCP Mode	2-90
2.3.13.1.5	Default VCP Mode B	2-90
2.3.13.2	RPG Products Window	2-90
2.3.13.2.1	Adaptation Data	2-90
2.3.13.2.1.1	Alert/Threshold	2-90
2.3.13.2.1.2	Generation List	2-94
2.3.13.2.1.3	Load Shed Products	2-101
2.3.13.2.1.4	Selectable Parameters	2-104
2.3.13.2.1.4.1	Cell Product Parameters	2-107
2.3.13.2.1.4.2	RCM Product Parameters	2-109
2.3.13.2.1.4.3	VAD and RCM Heights Selections	2-111
2.3.13.2.1.4.4	Layer Product Parameters	2-113
2.3.13.2.1.4.5	RCM Reflectivity Data Levels	2-115
2.3.13.2.1.4.6	Velocity Data Levels	2-117
2.3.13.2.1.4.7	OHP/THP Data Levels	2-119
2.3.13.2.1.4.8	STP Data Levels	2-121
2.3.13.2.1.5	Algorithms	2-123
2.3.13.2.1.6	Saving Adaptation Data	2-126
2.3.13.2.1.6.1	Saving RPG Adaptation Data from the RPG	2-126
2.3.13.2.1.6.2	Saving RPG Adaptation Data from the MSCF	2-127

TABLE OF CONTENTS

Paragraph		Page
2.3.13.2.1.6.3	Saving MSCF Adaptation Data from the RPG	2-127
2.3.13.2.1.6.4	Saving MSCF Adaptation Data from the MSCF	2-128
2.3.13.2.1.7	Restoring Adaptation Data	2-129
2.3.13.2.1.7.1	Restoring RPG Adaptation Data from the RPG	2-129
2.3.13.2.1.7.2	Restoring RPG Adaptation Data from the MSCF	2-130
2.3.13.2.1.7.3	Restoring MSCF Adaptation Data from the RPG	2-131
2.3.13.2.1.7.4	Restoring MSCF Adaptation Data from the MSCF	2-132
2.3.13.2.2	Display - Products in Database	2-134
2.3.13.2.2.1	Search Date/Time Box	2-135
2.3.13.2.2.2	Select Product Box	2-135
2.3.13.3	RPG Status	2-135
2.3.13.3.1	RPG Alarm Summary	2-137
2.3.13.3.2	Message Filter	2-138
2.3.13.3.3	System Log Messages	2-139
2.3.13.3.4	Print RPG Log Messages	2-140
2.3.13.4	RMS Button	2-140
2.3.13.4.1	RMS Messages (FAA: 1 or 2) Window	2-141
2.3.13.4.1.1	RMS Inhibit Time Window	2-142
2.3.13.4.1.2	RMS Free Text Message Window	2-142
2.3.14	Narrowband Connections Graphics.	2-143
2.3.15	USERS Icon.	2-143
2.3.15.1	Product Distribution Comms Status (PDCS) Window	2-144
2.3.15.1.1	Password	2-147
2.3.15.1.2	Product Distribution Lines Section	2-147
2.3.15.1.2.1	Prev-Next Arrows	2-147
2.3.15.1.3	Sort Options	2-147
2.3.15.1.4	Line Control Buttons	2-148
2.3.15.1.5	General Parameters Section	2-148
2.3.15.1.6	Line Management Section	2-149
2.3.15.1.6.1	Type	2-149
2.3.15.1.6.2	Port Identifier	2-149
2.3.15.1.6.3	The Port Identifier	2-149
2.3.15.1.6.4	Baud Rate	2-149
2.3.15.1.6.5	Time Limit	2-149
2.3.15.1.6.6	Comms Option.	2-150
2.3.15.1.7	Line/User Info Section	2-150
2.3.15.1.7.1	Class	2-150
2.3.15.1.7.2	Method	2-150
2.3.15.1.8	Dial-in Users Section	2-150
2.3.15.1.8.1	Paging Capability For Dial-in Lines	2-150
2.3.15.1.8.2	User ID/Name	2-151
2.3.15.1.8.3	Pswd (Identifier)	2-151
2.3.15.1.8.4	Ovr	2-151

TABLE OF CONTENTS

Paragraph		Page
2.3.15.1.8.5	T Limit	2-151
2.3.15.1.8.6	Class	2-151
2.3.15.1.8.7	Method	2-151
2.3.15.1.8.8	Add Dial-in User Button	2-152
2.3.15.1.8.9	Delete Dial-in User Button	2-153
2.3.15.1.9	Save Button	2-153
2.3.15.1.10	Undo Button	2-153
2.3.15.1.11	Baseline: Restore and Baseline: Update Buttons	2-153
2.3.15.2	User Products	2-154
2.3.15.2.1	Password	2-155
2.3.15.2.2	User Class	2-155
2.3.15.2.3	Set All Products	2-156
2.3.15.2.4	Filter Product List	2-157
2.3.15.2.5	Product List	2-157
2.3.15.2.6	Save Button	2-158
2.3.15.2.7	Undo Button	2-159
2.3.15.2.8	Baseline: Restore and Baseline: Update Buttons	2-159
2.3.16	Text Strings.	2-159
2.3.16.1	Top Center	2-160
2.3.16.2	Top of Radome	2-161
2.3.16.3	Left of Radome	2-161
2.3.16.4	Center (near top) in Radial Lines in VCP Button	2-161
2.3.16.5	Center (near top) under Radial Lines	2-161
2.3.16.6	Center of Tower - TPS	2-161
2.3.16.7	Center Left: Gen Off or On Line	2-162
2.3.16.8	Above Wideband Graphic	2-162
2.3.16.9	Center Top of RPG Icon	2-162
2.3.16.10	Bottom Lower Left	2-162
2.3.16.10.1	Feedback Line	2-162
2.3.16.10.2	Status Line	2-162
2.3.16.10.3	Alarms Line	2-162
2.3.16.11	Lower Right	2-162
2.3.16.12	Lower Right Under Users Icon	2-162
2.3.16.12.1	Precip Cat (Precipitation Category)	2-163
2.3.16.12.1.1	Modify Precipitation Detection Parameters	2-165
2.3.16.12.1.1.1	Add Precipitation Table Item	2-165
2.3.16.12.1.1.2	Modify Precipitation Table Item	2-167
2.3.16.12.1.1.3	Delete Precipitation Table	2-168
2.3.16.12.1.1.4	Save and Undo Buttons	2-168
2.3.16.12.1.1.5	Baseline: Restore and Baseline: Update	2-169
2.3.16.12.1.2	Precipitation Status Window Information	2-169
2.3.16.12.1.2.1	Time Until Clear Air	2-169
2.3.16.12.1.2.2	Detection Algorithm Executed	2-169

TABLE OF CONTENTS

Paragraph		Page
2.3.16.12.1.2.3	Category Current:	2-169
2.3.16.12.1.2.4	Time Last Detected: Light and Significant	2-169
2.3.16.12.1.2.5	Threshold and Detection Data	2-169
2.3.16.12.2	VAD Update	2-170
2.3.16.12.3	Auto PRF	2-170
2.3.16.12.4	Calib (Value) AUTO/MANUAL	2-171
2.3.16.12.5	Load Shed	2-171
2.3.16.12.6	Audio Alarms	2-173
2.3.16.12.7	RDA Messages	2-173
2.3.16.12.8	FAA Redundant Adaptable Parameters Match Adapt Times	2-173
2.3.17	Applications Icons.	2-174
2.3.17.1	Base Data Display	2-175
2.3.17.1.1	Scan and Elevation Buttons	2-175
2.3.17.1.2	Data Range Button	2-176
2.3.17.1.3	Filter Buttons	2-178
2.3.17.1.4	Moment Buttons	2-178
2.3.17.1.5	Grid Buttons	2-178
2.3.17.1.6	Map Buttons	2-178
2.3.17.1.7	Raw/Zoom Mode Buttons	2-178
2.3.17.2	Clutter Regions	2-178
2.3.17.3	Bypass Map Editor	2-178
2.3.17.4	PRF Selection	2-178
2.3.17.5	RDA Performance Data	2-179
2.3.17.5.1	Antenna/Pedestal Performance Data.	2-181
2.3.17.5.2	Calibration Performance Data.	2-182
2.3.17.5.3	Calibration Check Performance Data.	2-183
2.3.17.5.4	Device Status Performance Data.	2-184
2.3.17.5.5	Disk File Status Performance Data.	2-185
2.3.17.5.6	Receiver/Signal Processor Performance Data.	2-186
2.3.17.5.7	Tower Utilities Performance Data.	2-187
2.3.17.5.8	Transmitter Performance Data.	2-188
2.3.17.5.9	Wideband Communications Performance Data.	2-189
2.3.17.6	Console Messages	2-189
2.3.17.6.1	Destinations	2-190
2.3.17.6.2	Incoming Messages	2-190
2.3.17.6.3	Outgoing Messages	2-191
2.3.17.7	Environmental Data	2-191
2.3.17.8	HCI Properties	2-191
2.3.17.8.1	Change Passwords	2-192
2.3.17.8.2	Colors	2-193
2.3.17.8.3	Font Properties	2-193
2.3.18	Multiple Editors.	2-194
2.3.19	Low Bandwidth.	2-194

TABLE OF CONTENTS

Paragraph		Page
SECTION 2.4.	LOGIN/LOGOUT PROCEDURES	2-195
2.4.1	General.	2-195
2.4.2	Login.	2-195
2.4.2.1	Display Locked Window	2-195
2.4.2.2	User Name	2-195
2.4.2.3	Password	2-196
2.4.2.4	Common Desktop Environment (CDE)	2-196
2.4.2.5	Sun Window	2-197
2.4.2.6	Workspace Menu	2-197
2.4.2.7	Console Window	2-198
2.4.2.8	MSCF - Start	2-198
2.4.3	Logout.	2-198
SECTION 2.5.	LOADING SOFTWARE, BACKING UP SOFTWARE, EMERGENCY RECOVERY PROCEDURES	2-200
2.5.1	General.	2-200
2.5.2	System Time/Date.	2-200
2.5.3	Loading Software.	2-200
2.5.4	Backing Up Software.	2-200
2.5.4.1	System Software Backup Using ufsdump	2-201
2.5.4.2	RPG Applications Software Backup	2-201
2.5.4.3	MSCF Applications Software Backup	2-201
2.5.4.4	Backup of BDDS User Accounts Using tar	2-201
2.5.4.5	Backup of RPG or MSCF User Accounts Using tar	2-201
2.5.5	Emergency Recovery Procedures.	2-201
2.5.5.1	System Software Restoral Using ufsrestore (Individual File System Example)	2-201
2.5.5.2	RPG Applications Software Restoral	2-201
2.5.5.3	MSCF Applications Software Restoral	2-201
2.5.5.4	Restoral of RPG or MSCF User Accounts Made Using tar	2-202
2.5.5.5	Restoral of BDDS User Accounts Made Using tar	2-202
SECTION 2.6.	BASE DATA	2-203
2.6.1	Base Data Distribution.	2-203
2.6.1.1	Start	2-203
2.6.1.2	Stop	2-203
2.6.1.3	BDDS HCI	2-203
SECTION 2.7.	REDUNDANT CONTROL	2-204
2.7.1	Introduction.	2-204
2.7.2	NWS Redundant System Control.	2-204
2.7.3	FAA Redundant System Control.	2-204
2.7.3.1	MSCF Indication	2-204

TABLE OF CONTENTS

Paragraph		Page
2.7.3.2	FAA HCI Indications and Controls	2-206
2.7.3.2.1	RMS Button	2-207
2.7.3.2.1.1	RMS Messages (FAA: 1 or 2) Window	2-207
2.7.3.2.1.1.1	RMS Inhibit Time Window	2-207
2.7.3.2.1.1.2	RMS Free Text Message Window	2-208
2.7.3.2.2	RMS Lock Button	2-209
2.7.3.2.2.1	RDA Lock RMS Button	2-209
2.7.3.2.2.2	RPG Lock RMS Button	2-211
2.7.3.2.3	Comms State	2-211
2.7.3.2.4	Adapt Times Match/Mismatch	2-212
2.7.3.3	Changing Control Channels	2-213
2.7.3.3.1	FAA:1 HCI, Switching From Channel 2 To Channel 1	2-213
2.7.3.3.2	FAA:2 HCI, Switching from Channel 1 to Channel 2 and Back Again	2-215
2.7.3.4	Changing Adaptable Parameters on FAA Channels	2-217
2.7.4	FAA Channels and LOCA Passwords.	2-217
2.7.5	State of the System.	2-217
SECTION 2.8.	HELP	2-219
2.8.1	General.	2-219
2.8.2	The Electronic Performance Support System Concept.	2-219
2.8.3	Access to the EPSS.	2-219
2.8.3.1	EPSS Index	2-219
2.8.3.2	Example of EPSS Text	2-220
SECTION 2.9.	SECURITY	2-222
2.9.1	System Security Overview.	2-222
2.9.1.1	Definition of Terms and Services	2-222
2.9.1.1.1	Accountability and Audit	2-222
2.9.1.1.2	Discretionary Access Control (DAC)	2-222
2.9.1.1.3	Trusted Facility Operations	2-222
2.9.1.1.4	Identification and Authentication (I&A)	2-222
2.9.1.1.5	Files, Directories, and Permissions	2-223
2.9.1.1.6	Antivirus Software	2-223
2.9.1.2	Threats and Vulnerabilities	2-223
2.9.1.3	Countermeasures	2-223
2.9.1.4	Assumptions	2-223
2.9.1.5	Separation of Administrative Roles	2-224
2.9.1.5.1	User Requirements	2-224
2.9.1.5.2	Administrator Requirements	2-224
2.9.1.6	System Security Policy	2-224
2.9.2	Protection Mechanisms Available to Users.	2-224
2.9.2.1	System Access	2-224
2.9.2.2	Setting UP User Accounts	2-225

TABLE OF CONTENTS

Paragraph		Page
2.9.2.2.1	Password Requirements for Users	2-225
2.9.2.3	Warning Banner (Consent to Monitoring)	2-226
2.9.2.4	Incident Response	2-226
2.9.3	Protection Mechanisms Available to Administrators.	2-227
2.9.3.1	Accountability	2-227
2.9.3.1.1	Identification and Authentication Functions	2-227
2.9.3.1.2	Login Parameters	2-227
2.9.3.2	Audit	2-227
2.9.3.2.1	Activities and Events Audited	2-227
2.9.3.2.2	Runtime Auditing Activity	2-228
2.9.3.2.3	How to Access the Audit Logs	2-228
2.9.3.2.4	How to Access the Login Authentication Log	2-228
2.9.3.2.5	Reviewing Audit Logs	2-229
2.9.3.3	Routine Operations	2-229
2.9.3.3.1	Group Accounts	2-229
2.9.3.3.2	Security Relevant Files and Directories	2-229
2.9.3.3.3	Establishing User and Group Accounts	2-230
2.9.3.3.4	Changing/Modifying User Account and Password	2-236
2.9.3.3.5	Changing User Passwords	2-237
2.9.3.3.6	Changing File Permissions	2-238
SECTION 2.10.	SYSTEM BACKUP	2-244
2.10.1	JAZ Storage Device.	2-244
2.10.1.1	Formatting Blank JAZ Disks	2-244
2.10.1.2	Non-formatted Disk	2-245
2.10.1.3	Formatting a JAZ Disk at the RPG Drive and Other Options	2-245
2.10.2	JAZ Disk.	2-245
2.10.2.1	JAZ Disk Insertion	2-245
2.10.2.2	JAZ Disk Removal	2-246
CHAPTER 3	OPERATIONAL CONSIDERATIONS.....	3-1
SECTION 3.1.	INTRODUCTION	3-1
3.1.1	Scope of Operational Considerations.	3-1
SECTION 3.2.	RPG DATA PROCESSING	3-2
3.2.1	Introduction.	3-2
3.2.2	RPG Processor.	3-2
3.2.3	Wideband Communications.	3-3
3.2.4	Narrowband Communications.	3-3
3.2.5	HCI.	3-3

TABLE OF CONTENTS

Paragraph		Page
SECTION 3.3.	LOAD SHEDDING	3-4
3.3.1	Introduction.	3-4
3.3.2	CPU Load Control.	3-4
3.3.2.1	HCI Operator Control	3-4
3.3.3	Distribution Load Shed.	3-5
3.3.3.1	HCI Operator Control	3-9
3.3.4	Product Storage Load Shed.	3-9
3.3.4.1	HCI Operator Control	3-9
3.3.5	RDA Radial Load Shed.	3-10
3.3.6	RPG Radial Load Shed.	3-10
SECTION 3.4.	ADAPTATION DATA	3-11
3.4.1	Adaptation Data.	3-11
3.4.1.1	Alert/Threshold	3-11
3.4.1.2	Generation List	3-11
3.4.1.3	Load Shed Products	3-12
3.4.1.4	Selectable Parameters	3-12
3.4.1.5	Algorithms	3-13
SECTION 3.5.	VOLUME COVERAGE PATTERN	3-14
3.5.1	VCP Control Window.	3-14
3.5.1.1	Auto PRF On/Off	3-14
3.5.1.2	CHANGE to RDA VCP	3-14
3.5.1.3	DOWNLOAD VCP from RPG	3-14
3.5.1.4	Modify VCP	3-14
3.5.1.4.1	Modify VCP - Current	3-15
3.5.1.4.1.1	Velocity Increment	3-16
3.5.1.4.1.2	Modify Elevations Range	3-17
3.5.1.4.1.3	Area Obscuration Table	3-17
3.5.1.4.1.4	Composite Reflectivity and Obscuration Data Display Region	3-17
3.5.1.4.1.5	Modify Current VCP Data Table	3-17
3.5.1.4.2	Modify VCP - Adaptation	3-19
3.5.1.4.2.1	VCP Selection	3-19
3.5.1.4.2.2	Show: PRF# or RMAX	3-19
3.5.1.4.2.3	Velocity Increment	3-19
3.5.1.4.2.4	Adaptation Data Table	3-19
3.5.1.5	Restart VCP	3-19
3.5.1.6	Restart Elevation	3-19
3.5.2	PRF Selection Window.	3-21
SECTION 3.6.	VOLUME COVERAGE PATTERN (VCP) CHANGES AND AUTOMATIC PRF SELECTION.	3-23
3.6.1	Introduction.	3-23

TABLE OF CONTENTS

Paragraph		Page
3.6.2	VCP Modification and PRF Selection.	3-23
3.6.2.1	VCP Modification	3-23
3.6.2.2	Automatic PRF Selection	3-24
3.6.2.2.1	Auto PRF in the OFF Position	3-24
3.6.2.2.2	Auto PRF in the ON Position	3-24
SECTION 3.7.	SELECTION OF PRODUCT PARAMETERS	3-25
3.7.1	Introduction.	3-25
3.7.2	Cell Product.	3-26
3.7.2.1	How the Storm Cells are Limited	3-28
3.7.2.2	Considerations	3-28
3.7.3	Layer Product.	3-28
3.7.3.1	Layer 0 Height (KFt. MSL)	3-30
3.7.3.2	Layer 1 Height (KFt. MSL)	3-30
3.7.3.3	Layer 2 Height (KFt. MSL)	3-30
3.7.3.4	Layer 3 Height (KFt. MSL)	3-30
3.7.3.5	Range Limit	3-30
3.7.4	OHP/THP Data Levels.	3-30
3.7.4.1	First and Second Levels	3-32
3.7.4.2	Third through Sixteenth Levels.	3-32
3.7.5	RCM Product.	3-32
3.7.5.1	Range Threshold	3-34
3.7.5.2	Centroid Count	3-34
3.7.5.3	Restrict Class IV	3-34
3.7.5.4	Selection of Generation Time 1 and 2	3-34
3.7.6	RCM Reflectivity Data Levels.	3-35
3.7.7	STP Data Levels.	3-36
3.7.7.1	First and Second Levels	3-37
3.7.7.2	Third Through Sixteenth Levels	3-37
3.7.8	VAD and RCM Heights.	3-37
3.7.9	Velocity Data Levels.	3-39
3.7.9.1	First through Ninth Levels	3-40
3.7.9.2	Tenth through Fifteenth Levels	3-40
3.7.9.3	Sixteenth Level	3-40
3.7.10	Gage Bias Adjustment Toggle.	3-40
SECTION 3.8.	CLUTTER REGIONS	3-41
3.8.1	Introduction.	3-41
3.8.2	Clutter Regions Window Title.	3-42
3.8.3	First Line of Commands.	3-43
3.8.3.1	File Button and Files Window	3-43
3.8.3.2	Undo and Download Buttons	3-45
3.8.3.3	Baseline: Restore and Baseline: Update Buttons	3-46

TABLE OF CONTENTS

Paragraph		Page
3.8.3.4	Last Download Time	3-47
3.8.4	Graphics Utilization.	3-47
3.8.4.1	Current Display - Black Rectangular Square	3-47
3.8.4.2	Bypass Map Displays: Doppler Channel and Surveillance Channel	3-47
3.8.4.3	Bypass Map Display - Selections and Options	3-48
3.8.4.3.1	Segment: Low/High	3-48
3.8.4.3.2	Mode: Zoom/Sector	3-48
3.8.4.3.3	Units	3-48
3.8.4.3.4	Background Product	3-48
3.8.4.3.4.1	Specific Product	3-49
3.8.4.3.4.2	CFC Product	3-49
3.8.4.4	Low/High Elevation Segment Clutter Suppression Definition	3-50
3.8.4.4.1	Delete Button	3-50
3.8.4.4.2	Azimuth Changes	3-50
3.8.4.4.3	Range Changes	3-50
3.8.4.5	Select Code	3-50
3.8.4.6	Doppler and Surveillance Channel (Notch Width)	3-51
3.8.5	Clutter Contamination Impact on Meteorological Data Interpretation.	3-51
3.8.6	Base Data Estimate Bias Due to Ground Clutter Contamination.	3-51
3.8.6.1	Reflectivity (Z) Estimate	3-52
3.8.6.2	Mean Radial Velocity (V) Estimate	3-52
3.8.6.3	Spectrum Width (W) Estimate	3-53
3.8.6.4	Impact	3-53
3.8.7	Simplified Conceptual Model of Clutter Suppression Filter.	3-53
3.8.8	Overview of WSR-88D Clutter Suppression.	3-54
3.8.8.1	Default Notch Width Map	3-54
3.8.8.2	Bypass Map	3-54
3.8.8.3	Operator-Defined Clutter Suppression Regions	3-54
3.8.8.3.1	No Clutter Suppression	3-54
3.8.8.3.2	Bypass Map in Control Using the Operator-Specified Notch Width	3-54
3.8.8.3.3	Forced Clutter Suppression Using the Operator-Specified Notch Width	3-54
3.8.8.4	Notch Width Selections	3-54
3.8.8.4.1	Notch Width Selection 1	3-55
3.8.8.4.2	Notch Width Selection 2	3-55
3.8.8.4.3	Notch Width Selection 3	3-55
3.8.9	Negative Impacts of Inappropriate, Operator-Forced Clutter Suppression.	3-56
3.8.9.1	Zero Isodop Apparent in the Reflectivity Field	3-56
3.8.9.2	Data Smearing	3-56
3.8.10	Benefits Attained by Appropriate Clutter Suppression.	3-56
3.8.10.1	Improved Base Data Accuracy	3-56
3.8.10.2	Increased Availability of Second-Trip Velocity and Spectrum Width Data	3-57
3.8.10.3	Decreased Velocity Dealiasing Failures in Clear Air Mode	3-57

TABLE OF CONTENTS

Paragraph		Page
3.8.10.4	Improved Ability to Stay in Clear Air Mode	3-57
3.8.11	Suggested Clutter Suppression Management.	3-58
SECTION 3.9.	BYPASS MAP EDITOR	3-59
3.9.1	Introduction.	3-59
3.9.2	Top Row of Commands.	3-60
3.9.2.1	Close Button	3-60
3.9.2.2	Padlock Button	3-60
3.9.2.3	Save Button	3-60
3.9.2.4	Load Baseline Button	3-60
3.9.2.5	Undo Button	3-61
3.9.2.6	Request Button	3-61
3.9.2.7	Download Button	3-61
3.9.3	Remaining Controls.	3-61
3.9.3.1	Mode: Edit	3-61
3.9.3.2	Mode: Zoom	3-62
3.9.3.3	Grid On/Off	3-62
3.9.3.4	Segment Number	3-62
3.9.4	Generated: Line.	3-62
3.9.5	Edit Window.	3-62
SECTION 3.10.	ENVIRONMENTAL DATA	3-63
3.10.1	Introduction.	3-63
3.10.2	Top Row of Commands.	3-65
3.10.2.1	Close Button	3-65
3.10.2.2	Save Button	3-65
3.10.2.2.1	VAD Update Off	3-65
3.10.2.2.2	VAD Update On	3-65
3.10.2.3	Undo Button	3-65
3.10.2.4	Clear Button	3-65
3.10.2.5	Data Entry Button	3-66
3.10.2.5.1	Environmental Winds Data	3-67
3.10.2.5.2	Hail Temperature Heights	3-67
3.10.2.5.3	Default Storm Motion	3-68
3.10.3	VAD Update Commands and Units Selection Commands.	3-69
3.10.3.1	VAD Update	3-69
3.10.3.2	Wind Speed Units	3-69
3.10.4	Text Line of Last Updates.	3-69
3.10.5	Click and Drag Entries.	3-69
3.10.6	Red Outline, Environmental Data Icon, HCI.	3-70
SECTION 3.11.	PRECIPITATION DETECTION FUNCTION	3-71
3.11.1	Introduction.	3-71

TABLE OF CONTENTS

Paragraph		Page
3.11.2	Precipitation Detection Function and Nominal Clutter Area.	3-71
3.11.2.1	Precipitation Detection Function (PDF)	3-71
3.11.2.2	Precipitation Categories	3-73
3.11.2.3	Volume Coverage Pattern (VCP)	3-73
3.11.2.4	Suggested Strategy	3-73
3.11.3	Nominal Clutter Area Adjustments.	3-74
3.11.3.1	Clutter Suppression	3-74
3.11.3.2	Nominal Clutter Area	3-74
3.11.3.3	Anomalous Propagation Impact	3-74
3.11.3.4	Light Precipitation Impact	3-75
APPENDIX A	OPERATING FUNCTION OVERVIEW	A-1
A.1	OPERATIONAL MODES.	A-1
A.1.1	Clear Air Mode.	A-2
A.1.2	Precipitation Mode.	A-2
A.1.3	Mode Characteristics.	A-3
A.1.3.1	Volume Coverage Patterns (VCPs)	A-3
A.1.3.1.1	Scan Pattern.	A-3
A.1.3.2	PRI Patterns	A-3
A.1.3.2.1	Contiguous Surveillance	A-3
A.1.3.2.2	Contiguous Doppler	A-4
A.1.3.2.3	Batch Waveforms	A-4
A.1.3.3	Scan Strategies	A-4
A.1.3.3.1	Scan Strategy 1	A-7
A.1.3.3.2	Scan Strategy 2	A-7
A.1.3.3.3	Scan Strategy 3	A-7
A.1.3.3.4	MPDA Scan Strategy	A-7
A.2	RADAR DATA PROCESSING MODES	A-8
A.2.1	Base Data.	A-8
A.2.2	Surveillance Channel Waveforms.	A-8
A.2.3	Surveillance PRI Waveforms.	A-8
A.2.4	Range Unfolding.	A-8
A.2.5	Time Series Data Array.	A-8
A.2.6	Echo Return Processing.	A-9
A.2.6.1	Reflectivity	A-9
A.2.6.2	Mean Radial Velocity	A-10
A.2.6.3	Spectrum Width	A-10
A.3	PRODUCTS	A-14
A.3.1	Base Products.	A-14
A.3.1.1	Reflectivity (R)	A-14

TABLE OF CONTENTS

Paragraph		Page
A.3.1.2	Mean Radial Velocity (V)	A-14
A.3.1.3	Spectrum Width (SW)	A-14
A.3.2	Derived Products.	A-15
A.3.2.1	Combined Shear (CS)	A-15
A.3.2.2	Composite Reflectivity (CR)	A-15
A.3.2.3	Echo Tops (ET)	A-15
A.3.2.4	Severe Weather Analysis Display (SWR, SWV, SWW, SWS)	A-15
A.3.2.5	Severe Weather Probability (SWP)	A-16
A.3.2.6	Velocity Azimuth Display (VAD) and VAD Wind Profile (VWP)	A-16
A.3.2.7	Cross Section (RCS, VCS)	A-17
A.3.2.8	Storm Relative Mean Radial Velocity Map (SRM) and Storm Relative Mean Radial Velocity Region (SRR)	A-17
A.3.2.9	Vertically Integrated Liquid (VIL)	A-17
A.3.2.10	Storm Tracking Information (STI)	A-17
A.3.2.11	Hail Index (HI)	A-18
A.3.2.12	Mesocyclone (M)	A-18
A.3.2.13	Tornado Vortex Signature (TVS)	A-18
A.3.2.14	Storm Structure (SS)	A-18
A.3.2.15	Layer Composite Reflectivity (LRA, LRM)	A-19
A.3.2.16	User Alert Message (UAM)	A-19
A.3.2.17	Radar Coded Message (RCM)	A-19
A.3.2.17.1	Part A, Reflectivity.	A-19
A.3.2.17.2	Part B, VAD Winds	A-20
A.3.2.17.3	Part C, Remarks	A-20
A.3.2.18	Free Text Message (FTM)	A-20
A.3.2.19	Surface Rainfall Accumulation (OHP, THP)	A-20
A.3.2.20	Storm Total Rainfall Accumulation (STP)	A-20
A.3.2.21	Hourly Digital Precipitation Array (DPA)	A-21
A.3.2.22	Supplemental Precipitation Data (SPD)	A-21
A.3.2.23	Digital Hybrid Scan Reflectivity (DHR)	A-21
A.3.2.24	Hybrid Scan Reflectivity (HSR)	A-21
A.3.2.25	Layer Composite Reflectivity - AP Removed (APR)	A-21
A.3.2.26	Composite Reflectivity Edited - AP Removed (CRE)	A-22
A.3.2.27	ITWS Digital Base Velocity (DBV)	A-22
A.3.2.28	Clutter Likelihood Products	A-22
A.3.2.29	Clutter Likelihood Reflectivity (CLR)	A-22
A.3.2.30	Clutter Likelihood Doppler (CLD)	A-23
A.3.2.31	Superob (SO)	A-23
A.3.2.32	Digital VIL (DVL)	A-23
A.3.2.33	User Selectable Layer Composite Reflectivity Maximum (ULR)	A-24
A.3.2.34	Digital Storm Total Rainfall Accumulation (DSP)	A-24
A.3.2.35	Enhanced Echo Tops (EET)	A-24
A.3.2.36	Mesocyclone Rapid Update (MRU)	A-24

TABLE OF CONTENTS

Paragraph		Page
A.3.2.37	One Hour Snow Accumulation (OSW, OSD)	A-25
A.3.2.38	Storm Total Snow Accumulation (SSW, SSD)	A-26
A.3.2.39	User Selectable Snow Accumulation (USW, USD)	A-26
A.3.2.40	Mesocyclone Detection (MD)	A-26
A.3.2.41	Digital Mesocyclone Detection (DMD)	A-26
INDEX		Index-1
GLOSSARY OF TERMS		Glossary-1

LIST OF ILLUSTRATIONS

Paragraph		Page
Figure 1-1.	RPG Processor/Communications Assembly Cabinet	1-11
Figure 1-2.	MSCF Group and Components	1-12
Figure 1-3.	Remote RDA Maintenance Terminal UD32 (NWS Redundant) Component Location	1-17
Figure 2-1.	Front Panel	2-3
Figure 2-2.	RPG Control/Status (HCI) - NWS and DoD sites (Sheet 1 of 2)	2-8
Figure 2-3.	Warning_Popup	2-12
Figure 2-4.	Warning_Popup with Continue button	2-12
Figure 2-5.	Password window	2-13
Figure 2-6.	HCI Window Control	2-16
Figure 2-7.	Occupy Workspace Dialog Box	2-17
Figure 2-8.	Workspace Menu	2-18
Figure 2-9.	Keyboard	2-19
Figure 2-10.	Mouse	2-22
Figure 2-11.	MSCF Window	2-25
Figure 2-12.	Comms Status	2-27
Figure 2-13.	CISCO Switch	2-29
Figure 2-14.	CISCO Router	2-31
Figure 2-15.	Router Card Status	2-33
Figure 2-16.	Power Control	2-34
Figure 2-17.	BDDS HCI	2-36
Figure 2-18.	MSCF - FAA	2-38
Figure 2-19.	RPG Control/Status	2-42
Figure 2-20.	VCP Control	2-45
Figure 2-21.	PRF Selection (Modify Current VCP)	2-48
Figure 2-22.	Modify Current VCP Data	2-52
Figure 2-23.	Modify VCP Adaptation Data	2-55
Figure 2-24.	MLOS Status	2-59
Figure 2-25.	RDA Icon	2-61
Figure 2-26.	RDA Control/Status	2-62
Figure 2-27.	Moments	2-64
Figure 2-28.	VCP Control	2-65
Figure 2-29.	RDA State	2-65
Figure 2-30.	RDA Control	2-67
Figure 2-31.	RDA Control - Either	2-68
Figure 2-32.	RDA Power Source	2-68
Figure 2-33.	Interference Suppression	2-69
Figure 2-34.	Calibration	2-71
Figure 2-35.	Reflectivity Calibration	2-71
Figure 2-36.	Additional RDA Status Information	2-73
Figure 2-37.	RDA Alarms	2-75
Figure 2-38.	RDA Power Source Icons	2-79
Figure 2-39.	Bars Representing Three Moments	2-80

LIST OF ILLUSTRATIONS

Paragraph		Page
Figure 2-40.	RDA/RPG Interface Control/Status	2-81
Figure 2-41.	RPG Icon	2-84
Figure 2-42.	RPG Control	2-84
Figure 2-43.	RPG Init Options	2-87
Figure 2-44.	RPG Products	2-90
Figure 2-45.	Alert Threshold Editor	2-92
Figure 2-46.	RPG Product Generation Table Editor	2-95
Figure 2-47.	RPG Product Generation Table Editor - Password Protected	2-97
Figure 2-48.	RPG Product Priority (Load Shed Products)	2-102
Figure 2-49.	Edit Selectable Product Parameters	2-105
Figure 2-50.	Cell Product Parameters	2-108
Figure 2-51.	RCM Product Parameters	2-110
Figure 2-52.	VAD and RCM Heights Selections	2-112
Figure 2-53.	Layer Product Parameters	2-114
Figure 2-54.	RCM Reflectivity Data Levels	2-116
Figure 2-55.	Velocity Data Levels	2-118
Figure 2-56.	OHP/THP Data Levels	2-120
Figure 2-57.	STP Data Levels	2-122
Figure 2-58.	Algorithms	2-124
Figure 2-59.	Algorithm Adaptation Item Pull Down Menu	2-125
Figure 2-60.	Products in Database	2-135
Figure 2-61.	RPG Status	2-136
Figure 2-62.	RPG Alarm Summary	2-137
Figure 2-63.	Failed Task List	2-138
Figure 2-64.	Failed Control Task List	2-138
Figure 2-65.	RDA Alarm	2-139
Figure 2-66.	Print RPG Log Message	2-140
Figure 2-67.	RPG Control/Status - FAA	2-141
Figure 2-68.	RMS Messages	2-142
Figure 2-69.	RMS Inhibit Time	2-142
Figure 2-70.	RMS Free Text Message	2-143
Figure 2-71.	USERS Icon	2-144
Figure 2-72.	Product Distribution Comms Status - Lines 1-24 - Sheet 1 of 2	2-145
Figure 2-73.	Add Dial-In User	2-152
Figure 2-74.	RPG Product Distribution Control - Class 2 Users	2-155
Figure 2-75.	RPG Product Distribution Control - Class 4 Users	2-156
Figure 2-76.	RPG Control/Status - NWS and DoD Sites	2-160
Figure 2-77.	Lower Right Under USERS Icon	2-163
Figure 2-78.	Precipitation Status	2-164
Figure 2-79.	Modify Precipitation Detection Parameters	2-165
Figure 2-80.	Add Precipitation Table Item	2-166
Figure 2-81.	Modify Precipitation Table Item	2-167
Figure 2-82.	Load Shed Categories	2-171

LIST OF ILLUSTRATIONS

Paragraph		Page
Figure 2-83.	Applications Icons	2-174
Figure 2-84.	RPG Base Data Display	2-175
Figure 2-85.	Set Data Range	2-177
Figure 2-86.	RDA Performance Data	2-179
Figure 2-87.	RDA Antenna/Pedestal Performance Data	2-181
Figure 2-88.	RDA Calibration Performance Data	2-182
Figure 2-89.	RDA Calibration Check Performance Data	2-183
Figure 2-90.	RDA Device Status Performance Data	2-184
Figure 2-91.	RDA Disk File Status Performance Data	2-185
Figure 2-92.	RDA Receiver/Signal Processor Performance Data	2-186
Figure 2-93.	RDA Tower Utilities Performance Data	2-187
Figure 2-94.	RDA Transmitter Performance Data	2-188
Figure 2-95.	RDA Wideband Communications Performance Data	2-189
Figure 2-96.	Console Messages	2-190
Figure 2-97.	HCI Properties	2-191
Figure 2-98.	Change Passwords	2-192
Figure 2-99.	Font Properties	2-193
Figure 2-100.	CDE Login Window	2-196
Figure 2-101.	Workspace Menu	2-198
Figure 2-102.	Logout Confirmation	2-199
Figure 2-103.	Archive II LDM Data	2-203
Figure 2-104.	MSCF - FAA	2-205
Figure 2-105.	RPG Control/Status - FAA Sites	2-206
Figure 2-106.	RMS Messages (FAA:1 or 2)	2-207
Figure 2-107.	RMS Inhibit Time	2-207
Figure 2-108.	RMS Free Text Message	2-208
Figure 2-109.	RDA Control/Status - FAA	2-210
Figure 2-110.	RPG Control (FAA)	2-211
Figure 2-111.	Adapt Times: Match	2-212
Figure 2-112.	Adapt Times: Mismatch	2-212
Figure 2-113.	Adapt Times: Mismatch in RDA Control Window	2-213
Figure 2-114.	RDA Control/Status - (FAA:1)	2-214
Figure 2-115.	RDA Control/Status - (FAA: 2)	2-216
Figure 2-116.	EPSS Icon	2-219
Figure 2-117.	EPSS Example	2-220
Figure 2-118.	EPSS Example - Changing VCPs	2-221
Figure 2-119.	Workspace Menu	2-231
Figure 2-120.	Admintool: Users	2-232
Figure 2-121.	Admintool: Users Edit	2-233
Figure 2-122.	Admintool: Add User	2-234
Figure 2-123.	Account Security Password Options	2-235
Figure 2-124.	File Manager Icon	2-239
Figure 2-125.	File Manager	2-239

LIST OF ILLUSTRATIONS

Paragraph		Page
Figure 2-126.	File Manager - Selected Menu	2-240
Figure 2-127.	Properties - XXX	2-241
Figure 2-128.	Properties - (None)	2-242
Figure 2-129.	File Selection Dialog	2-243
Figure 3-1.	Load Control Processing Tasks (Sheet 1 of 2)	3-7
Figure 3-2.	VCP Control	3-14
Figure 3-3.	PRF Selection (Modify Current VCP)	3-16
Figure 3-4.	Modify Current VCP Data	3-18
Figure 3-5.	Modify VCP Adaptation Data	3-20
Figure 3-6.	PRF Selection (Modify Current VCP)	3-22
Figure 3-7.	Cell Product Parameters	3-27
Figure 3-8.	Layer Product Parameters	3-29
Figure 3-9.	OHP/THP Data Levels Product Parameters	3-31
Figure 3-10.	RCM Product Parameters	3-33
Figure 3-11.	RCM Reflectivity Data Levels Product Parameters	3-35
Figure 3-12.	STP Data Levels	3-36
Figure 3-13.	VAD and RCM Heights Product Parameters	3-38
Figure 3-14.	Velocity Data Levels Product Parameters	3-39
Figure 3-15.	Clutter Regions	3-42
Figure 3-16.	Clutter Region Files	3-43
Figure 3-17.	Clutter Region Filename	3-44
Figure 3-18.	Clutter Background Pull-Down Menu	3-49
Figure 3-19.	CFC Product Channel Selection	3-50
Figure 3-20.	Base Data Estimate	3-52
Figure 3-21.	Clutter Bypass Map Editor	3-59
Figure 3-22.	Environmental Data Editor	3-64
Figure 3-23.	Environmental Data Entry	3-66
Figure 3-24.	Precipitation Status	3-72
Figure A-1.	One Degree Radial Scan in Azimuth for Contiguous Surveillance and Contiguous Doppler Waveforms	A-11
Figure A-2.	Time Series Array Storage Format	A-12
Figure A-3.	Resolution of Contiguous Doppler AmbiguitySpecial Symbols	A-13

LIST OF TABLES

Paragraph		Page
Table 2-1.	Waveform Types	2-53
Table 2-2.	Waveform Types	2-56
Table 2-3.	Product Generation Table - Editable Parameters.....	2-98
Table 2-4.	Formatting JAZ 2GB Disk Cartridge.....	2-244
Table 3-1.	Expanded Version of Load Shed Products Window	3-5
Table 3-2.	Notch Width Selections and Suppression Values	3-55
Table A-1.	Pulse Repetition Period Data Delta A	A-4
Table A-2.	Pulse Repetition Period Data Delta B	A-5
Table A-3.	Pulse Repetition Period Data Delta C	A-5
Table A-4.	Pulse Repetition Period Data Delta D	A-6
Table A-5.	Pulse Repetition Period Data Delta E	A-7

FOREWORD

This technical manual provides operators with an overview of Doppler Meteorological Radar WSR-88D RPG. It describes the purpose, structure, and functions of the RPG and discusses the operating concepts. This manual was prepared in accordance with the content requirements of MIL-M-38798B and the format requirements of MIL-M-38784B, as amended by TMCR AF TM-86-01/NEXRAD (June 1987). It consists of three chapters, an appendix, a glossary, and an index.

Chapter 1 General Information. This chapter describes the purpose, structure, capabilities, and itemization of the RPG.

Chapter 2 Introduction. This chapter describes the RPG operations, procedures, controls and indicators.

Chapter 3 Operational Considerations. This chapter provides reference information for the RPG operator.

Appendix A Operating Function Overview

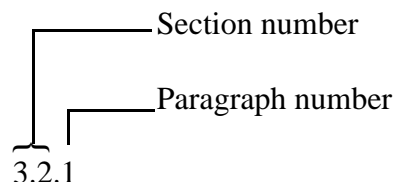
Index

Glossary

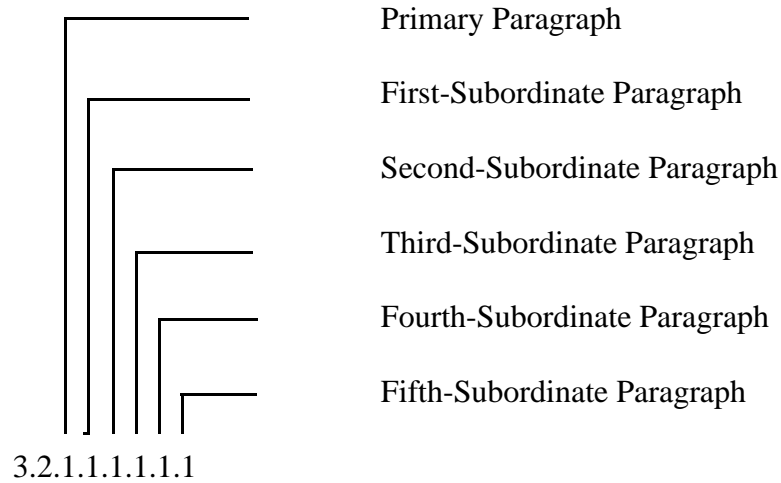
This manual is one of a family of technical manuals which provide various levels of description, operation, maintenance, and logistics information on the WSR-88D. Refer to TO 31-1-141, Basic Electronic Technology and Testing Practices, for any basic electronic technology or testing practice that is not fully described in these documents. The WSR-88D technical manual family is defined and discussed in the System Manual, NWS EHB 6-500, Section 1.4.

The format of this technical manual is as follows:

- Since sections represent the major content divisions of the chapter, they are formatted as physically-separate standalone elements.
- Sections are numbered as subdivisions of the chapter or appendix. The section numbering system consists of two digits separated by a decimal point. The first digit indicates the chapter, the second digit indicates the section. Thus, Section 3.2 represents the second section of Chapter 3.
- Paragraph numbering is by section rather than by chapter. The basic numbering system consists of three digits, where the first two digits identify the section



- A decimal paragraph number system is used to identify paragraph subordination



- Pages, tables, and figures are numbered by chapter. The number consists of two digits separated by a hyphen. The first digit identifies the chapter. The second digit identifies the page, table, or figure.

SAFETY SUMMARY

GENERAL SAFETY

The following are general safety precautions that are not related to specific procedures, and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position due to charges retained by capacitors. To avoid casualties, always remove power and discharge by grounding a circuit before touching it.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter an enclosure for the purpose of servicing or adjusting the equipment except in the presence of some one who is capable of rendering aid.

RESUSCITATION

Personnel working with or near high voltage should be familiar with modern methods of resuscitation. Such information may be obtained from the Red Cross or Heart Association. This knowledge may save a life.

PERFORM WORK RAPIDLY

When working in areas designated as hazardous, perform work using the proper safety procedure. Be thoroughly familiar with the procedures required for the task before entering the area.

SECURE ALL MATERIAL WHEN NOT IN USE

Secure all tools, chassis, and covers before operating equipment.

DO NOT USE METAL TOOLS NEAR EXPOSED PARTS

Do not use brushes, brooms, or other tools that have exposed metal parts within four feet of any electrical equipment having exposed current-carrying parts.

ELECTRICAL SHOCK HAZARDS

Prime power voltages and high voltages within cabinets can cause death or severe injury. These voltages are contained in the generator, RPG, RDA, and Antenna areas. Warning signs and labels

are located on the guards and barriers to alert personnel of the potential hazard. Do not disregard these warnings. Ensure that safety interlocks, barriers, and guards are not bypassed.

CHAPTER 1

GENERAL INFORMATION

SECTION 1.1. INTRODUCTION

The Radar Product Generator (RPG) Group represents the main input/control center for the Weather Surveillance Radar - 1988 Doppler (WSR-88D) system. A separate group called the Master System Control Function (MSCF) with a Human Computer Interface (HCI) is used by the operators for data entry, program control, local product generation, storage, selection and distribution, and as an on-line display and data interface for radar mode control. In addition, the HCI can be used by maintenance technicians for system test and troubleshooting.

The RPG Group equipment provides product generation, storage and distribution, system control, and data entry resources to support applicable computer program configuration items to which other WSR-88D system functions are allocated. It also provides the communications interfacing capability for other subsystems in the WSR-88D, including the Radar Data Acquisition (RDA) Group and all users of the products generated by the RPG, including the associated and non-associated users.

For ease of description, the term RPG in the context of this manual actually refers to RPG Applications.

1.1.1 Purpose of Manual.

The purpose of this manual is to provide the user with an overview of the RPG operation, equipment, and associated communications, detailed information on how to operate the radar, and operational guidance on how to optimize the performance of the radar.

1.1.2 Contents of Manual.

The contents of this manual include RPG Group hardware configurations and software descriptions, MSCF and HCI activations, shutdowns, and recoveries, relevant operations-oriented HCI

functions, and definitive step-by-step instructions leading to product generation, distribution, and manipulation. The major categories of instructions are:

- RDA Control and Alarms
- Wideband Status Control
- RPG Control, Products, and Status
- Product Distribution Communications Status
- Users Communications, Products, and Status
- Base Data
- Clutter Regions
- Bypass Map Editor
- PRF Selection
- RDA Performance Data
- Console Messages
- Environmental Data
- HCI Properties

1.1.3 Scope of Manual.

This manual provides the information and procedures to enable the user to exercise all capabilities and functions of the RPG and MSCF Group equipment in support of a WSR-88D facility. It is divided into three chapters and an appendix which are listed below:

- [Chapter 1](#) GENERAL INFORMATION - RPG and MSCF general information, operating concepts, equipment descriptions, and reference data.
- [Chapter 2](#) OPERATIONS - Controls, Indicators, Alarms Status, Users, Archive, Communications, Startup/Shutdown and Emergency/Recovery Procedures.
- [Chapter 3](#) OPERATIONAL CONSIDERATIONS - Operational considerations to include Data Processing, Clutter Regions, Bypass Map, VCP Control, PRF Selection, RDA P/M Data, Console Messages, Alert Threshold, Paired Products, and Environmental Winds.
- Appendices
 - Operating Function Overview
 - Glossary of Terms
 - Acronyms

SECTION 1.2. CHAPTER CONTENTS

This chapter is organized into sections as follows:

- Section 1.1. - INTRODUCTION
- Section 1.2. - CHAPTER CONTENTS
- Section 1.3. - HARDWARE FUNCTIONALITY
- Section 1.4. - SPECIFIC HARDWARE DESCRIPTION
- Section 1.5. - SOFTWARE DESCRIPTION
- Section 1.6. - CONSUMABLES/EXPENDABLES

SECTION 1.3. HARDWARE FUNCTIONALITY

The RPG primarily consists of the RPG Processor/Communications Assembly (RPGPCA) and a Master System Control Function (MSCF) terminal suite and printer. Wideband Communication Links, which connect the RDA to the RPG, along with Narrowband Communications Links, which provide communications with Associated and Non-Associated Users, are also part of the RPG Group. For NWS redundant systems, the RPG Group also includes a Remote RDA Maintenance terminal. For FAA redundant systems, there are two complete channels, each comprised of an RPG and RDA, plus a Remote Monitoring Subsystem.

1.3.1 RPG Functionality.

The RPG receives base data from the RDA Group and processes the data using stored algorithms to develop a set of derived meteorological products. The resulting product set, including the base products, is made available for distribution over narrowband communications links to Associated and Non-Associated Users. The RPG is also capable of distributing RDA digital-format base data to Base Data Users via an optional Base Data Distribution Server (BDDS). The RPG functional group includes all the hardware and software required for real-time generation, storage, and distribution of products for operational use. It also includes the hardware and software required for system remote control, status monitoring and error detection, product archiving, and hydro-meteorological data processing.

1.3.1.1 RPG Processor. The RPGPCA has an RPG processor which provides product generation, local storage, distribution control, and archiving of selected products and derived data. It provides for control of the RDA operating mode and monitoring of the operational status of the overall WSR-88D system. It provides the graphical HCI for system control and monitoring. It also provides a retransmission of the wideband data to the Base Data Distribution Server. The RPG processor includes a processor, monitor, keyboard, and mouse. The RPG processor exercises remote control of the RDA as controlled from the MSCF which has an identical HCI to the RPG.

1.3.1.2 Local Area Network (LAN) Switch. The LAN Switch provides the ethernet Transmission Control Protocol (TCP)/Internet Protocol (IP) network backbone for the system. Most of the RPGPCA components communicate with each other using the TCP/IP, and the LAN Switch provides the central interconnectivity point for these devices.

1.3.1.3 Power Administrator Masterswitch. The Power Administrator Masterswitch provides for individual control of the AC power to selected devices (eight maximum). This allows a selected device to be powered off and on remotely, thus achieving a remote reset capability for the device. The Power Administrator Masterswitch has eight 120-VAC, 15-Amp power receptacles and a 15-Amp circuit breaker.

1.3.1.4 Uninterruptible Power Supply (UPS). An UPS provides uninterrupted AC power to the Power Administrator Masterswitch and other selected devices in the RPGPCA cabinet. The UPS comes with Powerchute software which allows the System Administrator to monitor the UPS performance.

1.3.1.5 Base Data Distribution Server (BDDS). The BDDS receives a retransmission of the wideband data from the RPG processor and converts it to a unique, secure format for retransmission to the optional BDDS users. The BDDS is housed in the RPGPCA at NWS and DoD sites.

1.3.1.6 RDA/RPG Gateway. The High Density Line Control (HDLC) T1 wideband data enters the RPGPCA from the RDA. The RDA/RPG Gateway converts this data from the T1 DSX-1 analog format to high speed serial RS-530 data. This data is then fed directly to the Communication server. For NWS systems, the data first passes through the Channel Service Unit (CSU).

1.3.1.7 Communication Server. After generation, products from the RPG processor are forwarded as TCP/IP to the Communication Server via the LAN. The Communication Server performs the protocol conversion from TCP/IP to X.25 and then ships the data to the Dedicated/Dial modem Rack Assembly for distribution to Associated and Non-Associated Users.

1.3.1.8 RPG Router. The Router provides external access into the RPG LAN. It receives a TCP/IP feed from the LAN Switch. For the DoD and FAA systems, this Router allows the MSCF to access both the RPG LAN and the Power Administrator Masterswitch through a dedicated modem connection or a frame relay connection. For the FAA system, it also allows the MSCF to access the Channel 1 and Channel 2 RPG LAN and the Power Administrator Masterswitch through a dedicated modem connection or a frame relay connection.

1.3.1.9 Dedicated/Dial Modem Rack Assembly. The Dedicated/Dial Modem Rack Assembly is comprised of analog modems or modem-type devices for forwarding products and alert information in some cases, to the Associated and Non-Associated Users, using the designated dedicated or dial line. The Dedicated/Dial Modem Rack Assembly receives data for narrowband transmission from the Communication Server via a RS-232 serial link. DoD and FAA systems have an additional modem link or a frame relay connection for their Distant MSCF.

1.3.1.10 Storage Device. The RPGPCA has a storage device which can be used for creating back-up copies of system software. The storage device is connected directly to the RPG processor in the RPGPCA. A second storage device will be an expansion item not available at all sites.

1.3.1.11 Keyboard, Video, Mouse (KVM) Switch. The KVM Switch is installed in the RPGPCA cabinet when the BDDS is also located in the RPGPCA cabinet. It allows the RPG processor and BDDS processor to share a single Keyboard, Video Monitor, and Mouse.

1.3.1.12 17-Inch Monitor. The 17-Inch Monitor is connected to the RPG processor. When the BDDS processor is also located in the RPGPCA cabinet, the monitor will be directly connected to the KVM switch to allow sharing of the Monitor between the two processors.

1.3.1.13 Keyboard and Mouse. The Keyboard and Mouse will be connected to the RPG processor. When the BDDS processor is located in the RPGPCA cabinet, then Keyboard and Mouse will be directly connected to the KVM switch to allow sharing between the two processors.

1.3.1.14 Short-Haul Modem. The Short-Haul Modem is used to interface the MLOS Radio Cabinet alarm link to the RPG processor. It receives a modulated audio carrier via a twisted pair cable and converts it to serial digital data for input to the RPG processor.

1.3.1.15 Dial Patch Panel. The Dial Patch Panel supports the testing of up to twenty-four, 2-wire dial lines. The panel connects the dial-port modems via the Automatic Call Unit (ACU), Dial Adapter Panel, and the telephone company's demarcation frame to the public telephone switched network.

1.3.1.16 Dial Adapter Panel. The Dial Adapter Panel is used to connect the dial-port modems to the Dial Patch Panel. It provides a cable transition between the output cables for up to 24 modems and the single input cable to the telephone patch panel.

1.3.1.17 Dedicated Adapter Panel. The Dedicated Adapter Panel is used to connect the dedicated port modems to the Dedicated Patch Panels. It provides a cable transition between the output cables for up to 24 modems and input cables from up to two telephone patch panels.

1.3.1.18 Dedicated Patch Panels. Each Dedicated Patch Panel supports the testing of up to twelve, 4-wire leased telephone lines. The panel connects the Dedicated Adapter Panel's port modems to the telephone lines via the telephone company's demarcation frame. Two Dedicated Patch Panels can be used in system configurations.

1.3.1.19 Channel Service Unit (CSU) (NWS only). The T1 DSX-1 formatted wideband data enters into the RPGPCA CSU from the RDA and then the data is forwarded on to the RDA/RPG Gateway. The CSU provides proper interface for the T1 circuit and regenerating the signal.

1.3.2 Wideband Communications.

A wideband communications link is used to exchange both base data and radar status and control data between an RDA and its associated RPG group. Depending on the distance and local requirements, the wideband communications link between particular sites may be a Direct Wire link (for distances up to 400 ft.) or a Microwave Line-of-Sight (MLOS) link (for distances from 0.6 through 24 miles). Two types of T1 carrier systems may also be used: private T1 and telephone company (TELCO) T1. Private T1 is used when the link distance is less than 3,000 feet. In a TELCO T1 system, the telephone company's facilities are used as the medium for the digital pulse stream. A RDA CSU and a RDA/RPG Gateway in the RPG PCA are used to hook into the telephone system. For NWS systems, the RDA CSU sends the T1 signal to the CSU in the RPG-PCA cabinet before being sent to the RDA/RPG Gateway. TELCO T1 provides communications for unlimited distances; it is used when it is available and economically feasible.

1.3.3 Narrowband Communications.

Narrowband communications links are used between the RPG and its Associated Users for internal product requests and distribution, for inter-unit product requests and distribution, and for distribution of products to Non-Associated Users. The narrowband communications links are modem-based serial data links which are either directly interconnected for internal communica-

tions, or utilize transmission over dedicated or dial-up commercial telephone lines for external data distribution.

1.3.4 Redundant Systems.

There are two types of redundant systems. They are National Weather Service (NWS) Redundant Systems and Federal Aviation Administration (FAA) Redundant Systems and are named, respectively, after the agencies that own them.

1.3.4.1 NWS Redundant System. The NWS Redundant System contains one RPG, two RDAs, and a switch which sends either RDA's information to the single RPG. Selecting between the two RDAs and control of the system is performed at a remote RDA maintenance terminal inside the NWS office.

1.3.4.1.1 Remote RDA Maintenance Terminal. For NWS Redundant Systems, a remote RDA maintenance terminal provides the interface that allows the user to interact with the RDA processor operating system, application and maintenance programs, and the Control Diagnostics System (CDS). The remote RDA maintenance terminal connects to the Channel 1 RDA through a dial line. The terminal contains a dial port modem and STATMUX to transmit/receive and multiplex/demultiplex the application and system port lines of both Channels 1 and 2. It also contains a Dual A/B switch used to select which channel is connected to the terminal.

1.3.4.2 FAA Redundant System. The FAA Redundant System contains two RPGs, each connected to a corresponding RDA. Each RDA/RPG pair is referred to as a channel. Channel 1 RPG is designated UD170. Channel 2 the RPG is designated UD70. The FAA redundant system also contains a relay box that switches either RPG's information to associated and non-associated users via narrowband communication lines. Selection between the two channels, data entry, and program control for the system is performed at a distant MSCF.

1.3.4.2.1 FAA Remote Monitoring Subsystem (RMS). The FAA has a Remote Monitoring Subsystem that allows the FAA user to monitor and operate both RPGs, both RDAs, and all the tower facilities from a remote location. The system controls the channel selection, power sources, and all aspects of the redundant system remotely.

1.3.4.2.2 Remote Monitoring Subsystem (RMS) Power Administrator. FAA Redundant Systems have additional Power Administrators. These Power Administrators are controlled through the FAA RMS.

1.3.4.2.3 Relay Box. Only FAA Redundant Systems have a relay box. The relay box contains up to 60 relays that are used to switch narrowband communication lines from Channel 1 or Channel 2 to associated and non-associated users. The relay box is not located within the RPGPCA, but mounted on the RDA shelter wall.

1.3.5 Master System Control Function (MSCF) Equipment UD71.

The MSCF is the man/machine interface that allows the operator or maintenance technician to interact with the RPG processor operating system, application software, and maintenance programs. The application specifically designed to provide the graphical control interface to the RPG processor is the HCI. The MSCF provides control over the RPG processing functions by permitting the selection of products to be routinely generated and a product subset to be archived. It also provides the interface to access the operating system, initialize the RPG processor, and perform first level analysis of system malfunctions.

The MSCF is comprised of a terminal suite containing a processor, monitor, keyboard, and a color printer.

1.3.5.1 Local MSCF. The MSCF is normally collocated with the associated user. Thus, with NWS systems, the MSCF will be located locally (within the same building) with the RPG processor. For NWS systems, the MSCF is considered to be local to the RPG and has a direct TCP/IP path to the RPG processor (through the LAN Switch). The MSCF also has a serial connection for access to the Power Administrator Masterswitch in the RPGPCA.

1.3.5.2 Distant MSCF. The Distant MSCF may be many miles from the RPG processor. For DoD and FAA systems, a Distant MSCF is connected to the RPG via an asynchronous serial PPP port or a serial fractional T1 port, depending on whether frame relay service is used. For FAA systems, the Distant MSCF link is switched in the relay box with connections to the RPG router in each channel. The router in the RPG cabinet is connected to the serial interface of the power administrator and allows for an out-of-bandwidth serial link to the power administrator for performing power off/on resets. The Distant MSCF provides an operator interface for control and monitoring. When the MSCF is distant, the following configurations will exist.

- DoD Collocated RDA/RPG without frame relay: For DoD systems, the MSCF is considered to be distant from the RPG processor because the RPG is collocated with the RDA and usually miles away from the MSCF. The Distant MSCF is linked to the RPG via a dedicated modem at both the MSCF and RPG. The majority of the DoD systems have the MSCF at NWS sites.
- DoD Collocated RDA/RPG with frame relay: For DoD systems, the MSCF is considered to be distant from the RPG processor because the RPG is collocated with the RDA and usually miles away from the MSCF. The Distant MSCF is linked to the RPG via a frame relay circuit with a frame relay hub router at a NWS site.
- FAA Collocated RDA/RPG without frame relay: For FAA systems, the MSCF is considered to be distant from the RPG processor because the RPG is collocated with the RDA normally a long distance away from the MSCF. The Distant MSCF is linked to the RPG via a dedicated modem at both the MSCF and RPG.
- FAA Collocated RDA/RPG with frame relay: For FAA systems, the MSCF is considered to be distant from the RPG processor because the RPG is collocated with the RDA normally a long distance away from the MSCF. The Distant MSCF is linked to the RPG via a frame relay circuit with a frame relay hub router at a NWS site.

1.3.6 Printer.

The MSCF color printer is a Tektronix Phaser 750 Laser Color Printer that comes standard with 32 MB of memory. The resolution is a maximum 1200dpi resolution (600 dpi for color resolution). Printer speed is 5 ppm with color printing, 16 ppm with black and white printing. There are four toner cartridges: black, cyan, magenta, and yellow. The black cartridge has a 12,000-page capacity (high) or a 5,000-page capacity (standard), while the color cartridge has a 10,000-page capacity (high) or a 4,000-page capacity (standard). The MSCF color printer resides on a printer table normally adjacent to the MSCF components.

SECTION 1.4. SPECIFIC HARDWARE DESCRIPTION

1.4.1 RPG Equipment Description.

The RPG Group is comprised of the RPGPCA and Remote RDA Maintenance Terminal. This section lists and describes the major components which make up the RPG Group. This equipment is shown in [Figure 1-1](#) and [Figure 1-3](#).

The MSCF Group is comprised of the MSCF terminal suite, modem, and color printer. This equipment is shown in [Figure 1-2](#).

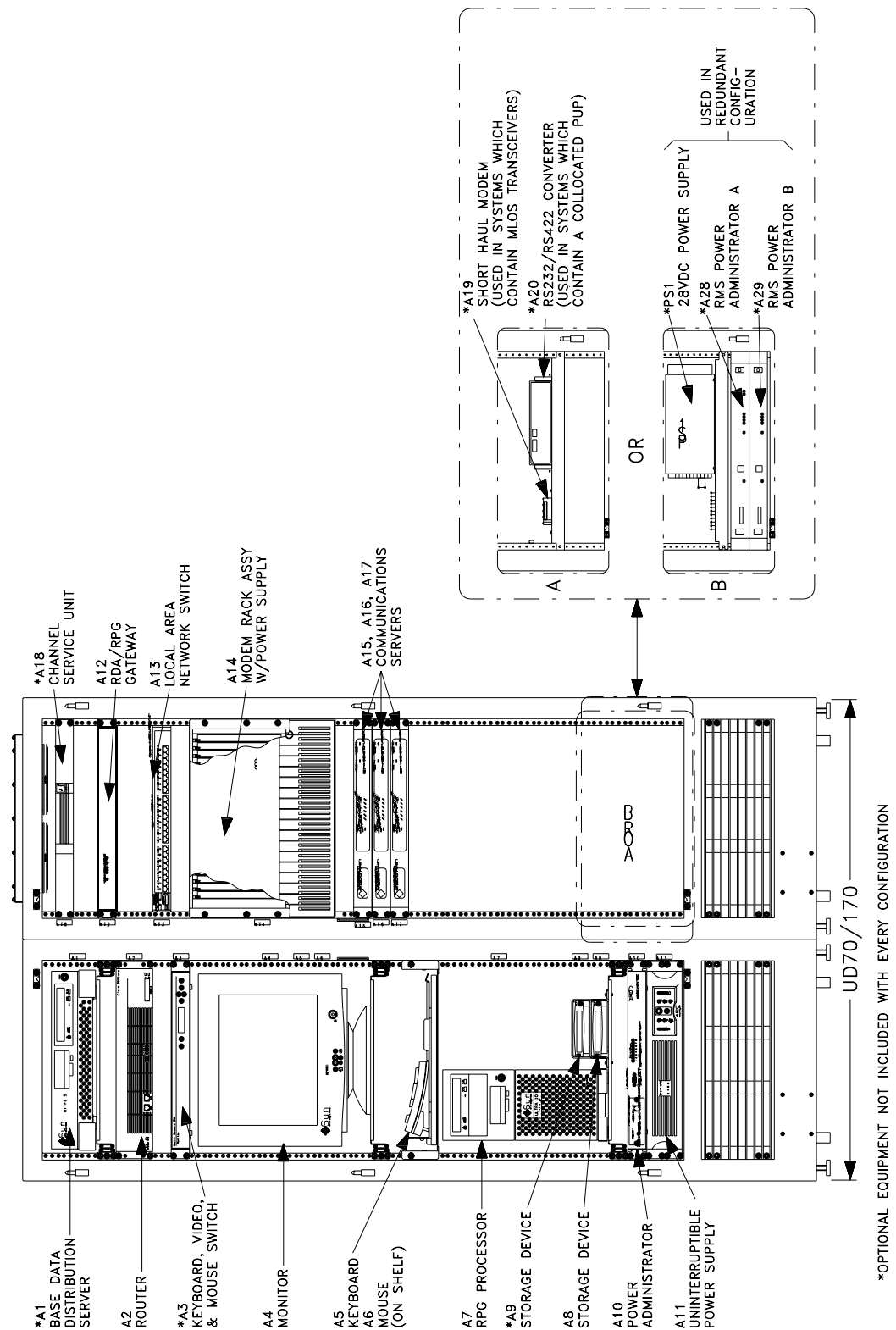
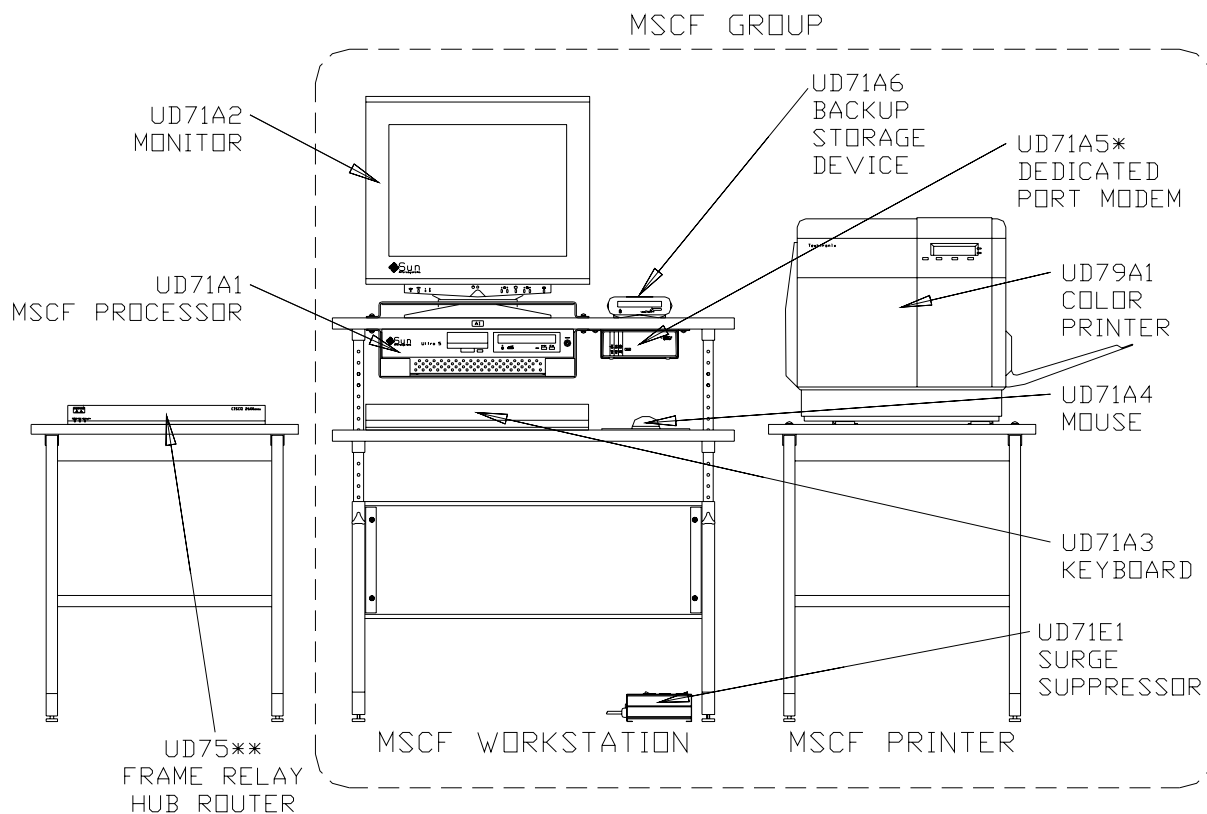


Figure 1-1. RPG Processor/Communications Assembly Cabinet



** TABLE OR TABLE SPACE
SUPPLIED BY SITE

* DISTANT MSCF WORKSTATION
ONLY (DOD AND FAA)

Figure 1-2. MSCF Group and Components

1.4.2 RPGPCA UD70.

The RPGPCA UD70 (Figure 1-1) provides the computation, storage, and data entry resources necessary to support on-line product generation and off-line execution of RPG test software.

The RPGPCA components are listed as follows:

- RPG Processor
- LAN Switch
- Power Administrator Masterswitch
- UPS
- BDDS
- Communications Server
- Router
- Narrowband Communications Equipment
- Storage Device
- Channel Service Unit (CSU) (NWS only)

1.4.2.1 RPG Processor. The RPG processor is a Sun Ultra 10 workstation (UD70A7). It is a uniprocessor system that uses an UltraSPARC 440 MHz or faster Processor. The RPG processor has two 128 MB DIMMs for a total of 256 MB of RAM. The standard diskette drive (floppy) supports standard 3.5 inch diskettes. A CD-ROM drive is included. The primary hard drive has a 9.1 GB formatted capacity. An optional (slave) hard drive may also be installed. The remainder of the workstation consists of a Sun 17 inch color monitor, keyboard, and mouse.

1.4.2.2 LAN Switch. The Cisco 2924 LAN Switch is the backbone of the RPG system. This LAN Switch (UD70A13) provides 24 switchable 10BaseT or 100BaseT RJ-45 jacks. The switch is a self-contained unit with an integrated power supply and 4 MB of internal memory. The switch provides auto-sensing for switching between 100 Mbps and 10 Mbps and also provides autonegotiation of half-duplex and full duplex operations.

1.4.2.3 Power Administrator Masterswitch. American Power Conversion (APC) Power Administrator Masterswitch (UD70A10) provides for individual control of AC power to selected devices (eight maximum). This allows a selected device to be powered off and on remotely, thereby achieving a remote reset capability for the device. The Power Administrator Masterswitch has eight 120-VAC 15-amp power receptacles and a 15-amp circuit breaker.

1.4.2.4 UPS. An APC SmartUPS 1400 (UD70A11) provides the uninterrupted AC power for the Power Administrator Masterswitch and other selected devices in the RPG processor/Communications Assembly (UD70). It has a maximum load of 950 Watts or 1400 VA (950 W * 1.4). It has 6 outlet receptacles for components to utilize the UPS. Its runtime is dependent on the load utilizing the UPS; it ranges from 7.4 minutes at full-load to 21 minutes at half-load. Recharge time to

return UPS to 90% from 50% is 1 to 2 hours. The UPS comes with Powerchute software which allows the user to monitor the UPS performance.

1.4.2.5 BDDS. The BDDS processor is a Sun Ultra 5 workstation. It is a uniprocessor system that uses an UltraSPARC 333 MHz Processor. The BDDS has 256 MB of RAM. The BDDS Ultra 5 Processor has one 128 MB DIMM for RAM. The standard diskette drive (floppy) supports standard 3.5 inch diskettes. A CD-ROM drive is included. The hard drive for the system has a 9.1 GB formatted capacity. The remainder of the workstation consists of a keyboard and mouse. The BDDS shares a Sun 17 inch color monitor, keyboard, and mouse (via a KVM switch) with the RPG processor.

1.4.2.6 Communication Server. The PTI MPS 800 Multi-Protocol Server (MPS) is a LAN-to-WAN data communications server. It connects to the LAN through a TCP/IP Ethernet interface and provides wide-area network (WAN) connectivity via its serial ports. In the RPG system, three communication servers are used and each can “serve” up to eight separate communications links. It utilizes a Motorola MPC860T Power PC as the main processor/communications controller and a Motorola MC68360 as a slave processor/communications controller. It has 16 MB of main memory, 1 MB of Synchronous Static Random Access Memory (SSRAM), 1 MB of applications flash memory, and 512 KB of boot flash memory. The servers perform the protocol conversion from TCP/IP and then ship the data to the Dedicated/Dial Modem Rack Assembly for distribution to associated, non-associated, and other users.

1.4.2.7 Router. The Cisco 3640 Router is a multifunction platform that combines dial access, routing, and LAN-to-LAN services. The standard components include a 100 MHz IDT R4700 RISC Processor, 2 PCMCIA slots, high-speed console and auxiliary ports, and 36 MB of DRAM memory. For NWS systems, the Router acts as a bridge between the two LAN systems (RPG and AWIPS). For DoD and FAA systems, the Router provides a link for the Distant MSCF through use of a serial RS-232 port or a fractional T1, depending on whether frame relay service is used. The Router provides for a protocol translation from TCP/IP to a serial-asynchronous Point-to-Point Protocol (PPP) where dedicated-port modems are used.

1.4.2.8 Narrowband Communications Equipment. The RPG Narrowband Communications Equipment consists of Class 1 (dedicated) and Class 2 (dial) modems and a RS-232/RS-422 converter. The narrowband equipment allows communication between the RPG processor and end users.

1.4.2.9 Storage Device. The Iomega JAZ Storage Device is a portable external storage device which uses disks for data storage. Each JAZ disk has the capacity to store 2 GB (2,000 MB) of data. This component is used to create backups for the RPG system software. A second archive storage device is an expansion item and may not be fielded at all sites.

1.4.2.10 Channel Service Unit (CSU) (NWS only). The TI DSX-1 formatted wideband data enters into the RPGPCA CSU from the RDA (via the cabinet I/O entrance panel) and then the data is forwarded on to the RDARPG Gateway UD70A12. The CSU is responsible for providing proper electrical interface to the T1 circuit and for shaping and regenerating the signal. The CSU

supports a loopback test from a remote end and a test switch is provided to activate a loopback test from the local end.

1.4.3 MSCF Equipment.

A single MSCF is provided for the RPG. The MSCF provides an operator interface from which control and monitoring functions are carried out.

The MSCF major components are listed as follows:

- MSCF Terminal Suite (Processor, Monitor, Keyboard and Mouse)
- MSCF Color Printer
- MSCF Table
- Dedicated-Port Modem (Select DoD sites and FAA Only)
- Frame Relay Hub Router (FAA sites and select NWS sites associated with DoD sites)
- Backup Storage Device
- Surge Suppressor

1.4.3.1 MSCF Terminal Suite. Included in the MSCF Terminal Suite is a Sun Ultra 5 computer, monitor, keyboard, and mouse. The MSCF processor is a uniprocessor system that uses an UltraSPARC 400 MHz or faster Processor. The MSCF Ultra 5 Processor has one 128 MB DIMM for RAM. The standard diskette drive (floppy) supports standard 3.5 inch diskettes. A CD-ROM drive is included. The hard drive for the system has a 9.1 GB formatted capacity. The monitor for the MSCF is a Sun 21 inch color monitor. The MSCF (See [Figure 1-2](#)) includes the MSCF Terminal Suite (which supports the operator interface that is necessary to implement the RPG and RDA control and status monitoring functions), a color printer, backup storage device, and the MSCF table. The MSCF components are located on the table with the surge suppressor on the floor under the MSCF table.

1.4.3.2 DoD and FAA MSCF Communications. The distant MSCF provides an operator interface from which control and monitoring functions are carried out. The distant MSCF data communications with the RPG are via a dedicated narrowband communications link using a modem at both the MSCF and RPG or frame relay service with a frame relay hub router at the associated NWS site.

1.4.3.3 NWS Communications. With NWS systems a local MSCF is located with the RPG, and a direct TCP/IP link via the RPG LAN is provided to the local MSCF.

1.4.4 FAA Unique Hardware.

FAA Redundant Systems have equipment which are unique to the FAA system. These are the RMS Power Administrator Masterswitch and Relay Box.

1.4.4.1 RMS Power Administrators. Two Baytech Power Administrators are used in the FAA system. They are housed in the RPGPCA. They provide for individual control of AC power to selected devices (four maximum on each administrator). This allows a selected device to be powered off and on remotely. However, unlike the APC Power Administrator Masterswitch, these RMS Power Administrators are not controlled through the LAN or a serial connection to the MSCF processor. Rather, they are controlled through a serial RS-232 connection from the FAA RMS.

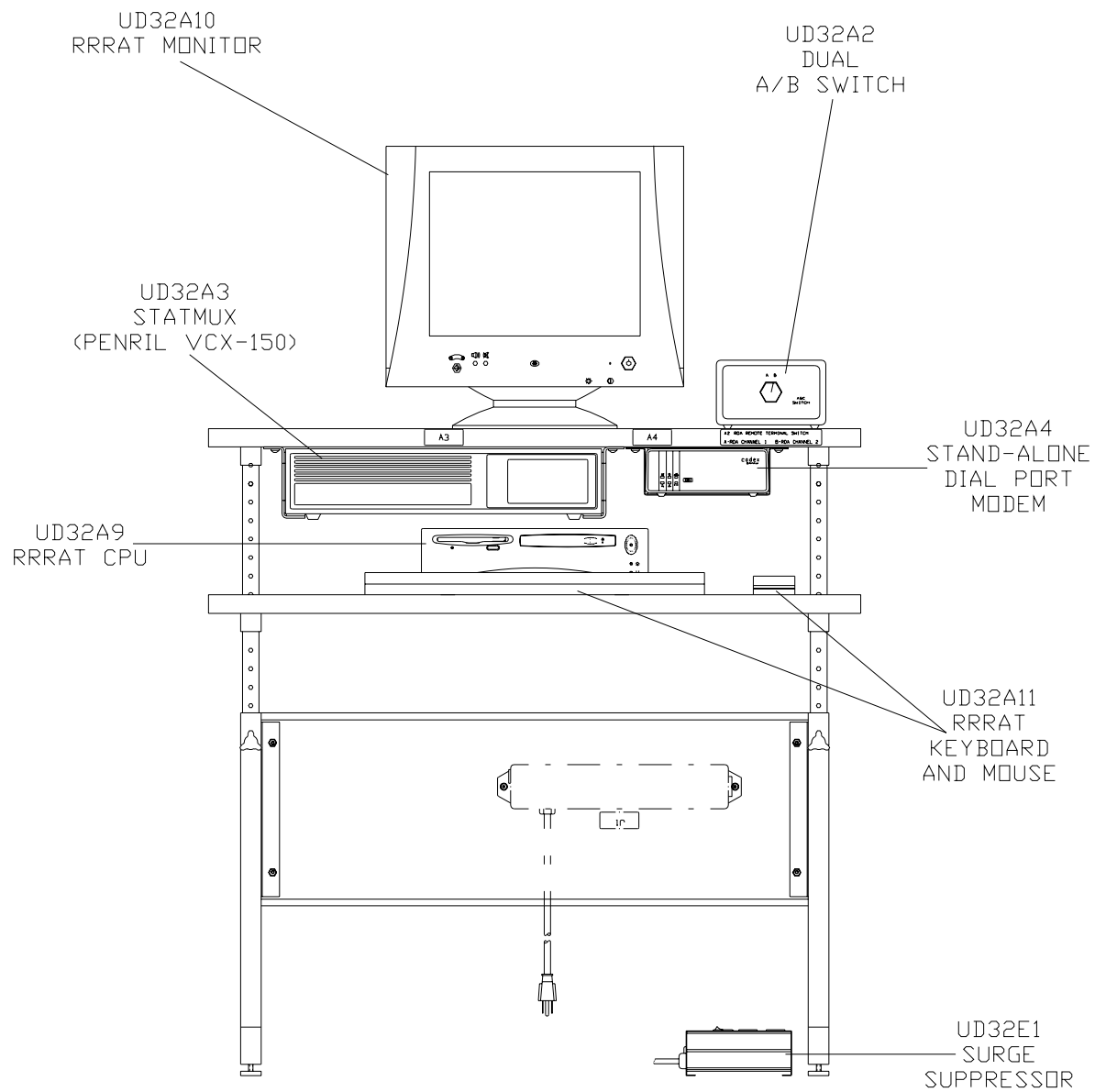
1.4.4.2 Relay Box. The relay box is used with FAA redundant systems. It is housed on an inner wall of the RDA shelter. It contains two relay driver circuits and 60 relays, some of which are not used. The relays are used to switch narrowband communication lines from/to associated and non-associated Users to either RPG Channel 1 or RPG Channel 2. The relays are controlled by the RPG Data Processors in each RPG channel.

1.4.5 NWS Unique Hardware - Remote RDA Maintenance Terminal (UD32).

The Remote RDA Maintenance Terminal ([Figure 1-3](#)) is provided to NWS Redundant Systems only. Its major components are:

- RDA/RPG Remote Access Terminal (RRRAT) equipment (CPU, Monitor, Keyboard, and Mouse)
- Standalone dial port modem
- Dual A/B switch
- Statmux

The Remote Maintenance Terminal (UD32) utilizes the RRRAT equipment to run two primary software packages: pcANYWHERE and PC-Passport. PC-Passport is a Concurrent emulator software package, which allows the PC-based system to communicate with the Concurrent-based RDA computer. pcANYWHERE is the communications software package used for remote access. With this remote dial-up capability, it allows the technician, or operator, at the NWS Forecast Office (or any remote location with phone connectivity) to dial into the RDA MMI and access both the Applications and System Console screens. The dual A/B switch enables the terminal to access the application and system ports of either RDA Channel 1 or Channel 2. The Statmux separates the Applications and System Console screens that were multiplexed into a single data stream at the Statmux in Channel 1 of the RDA Cabinet. Communication with the two RDA channels is accomplished via the dedicated-port modem. For further information, refer to the User's Guide - NWS Redundant RDA/RPG Remote Access Terminal Manual.



NX1789

Figure 1-3. Remote RDA Maintenance Terminal UD32 (NWS Redundant) Component Location

SECTION 1.5. SOFTWARE DESCRIPTION

1.5.1 RPG Group Software.

The operational software is executed in the processing equipment associated with the RPG functional area to accomplish all operational requirements. The program software controls and monitors the operational equipment and permits operator/machine interfacing actions. The Computer Program Configuration Items (CPCIs) identify computer software programs unique to the WSR-88D system. These computer software programs consist of operating system software and application software.

The RPG operational software programs consist of the following:

- UNIX Operating System
- RPG Software Program (CPCI 03)

1.5.2 UNIX Operating System.

UNIX is a multi-user, multi-tasking operating system (OS) originally developed by AT&T. The UNIX OS manages memory, controls hard and floppy disk drives, and loads and executes programs. The UNIX OS is comprised of two key components: the kernel and the shell.

The kernel is the program responsible for the machine level operation of the system and for the connection to hardware devices. The kernel can communicate to the hardware or to the shell to complete fundamental tasks.

The shell is the command line interface that processes user commands and can talk to all of the system except hardware. The shell retrieves the files that hold instructions for every command that's typed in and it allows the user to utilize the services of the kernel. The three available shells are the C shell, Bourne shell, and Korn shell. The C shell is used for the RPG software.

1.5.3 RPG Software Program (CPCI 03).

This CPCI provides an operator interactive computer program which operates in a multiprocessing environment. It is possible, however, to perform RPG functions in either a fully automated or an operator interface mode. The RPG processes radar data to generate products containing information on related meteorological phenomenon. These products can then be stored and distributed to the users of the WSR-88D system. The RPG program is divided into five tasks:

- Acquire Radar Data
- Acquire Gauge-Radar Bias Table Data
- Generate Products
- Distribute Products
- Control System

1.5.3.1 Acquire Radar Data. This function interfaces with the RDA via a bidirectional wideband link to receive base data and status information and to transmit RDA control information. In addition, it provides for the distribution of base data to optional base data users.

1.5.3.2 Acquire Gauge-Radar Bias Table Data. This function receives a table of Gauge-Radar Biases, determined over various time spans from AWIPS, for use in applying a mean-field bias correction to RPG Precipitation Processing Series (PPS) accumulation products.

1.5.3.3 Generate Products. This function converts base data into meteorological products consisting of base, derived, and alphanumeric products.

1.5.3.4 Distribute Products. This function provides for the distribution of products to Associated and Non-Associated Users, and provides for the on-line storage and archiving of these products.

1.5.3.5 Control System. This function performs system control tasks including RDA control, RPG processing control, system control (MSCF), and WSR-88D System status monitoring and error detection.

1.5.3.6 CPCI 03 Interface Requirements. This CPCI functionally interfaces with operational position hardware, operational CPCIs, WSR-88D System interfaces, and support CPCIs.

1.5.3.6.1 Hardware Interfaces. The RPG software program operates on a Sun Ultra 10 Processor and peripherals. The hardware interfaces consist of RPG processor(s), mass storage, display terminal, and communications equipment.

1.5.3.6.2 Operational Computer Program Interfaces. The RPG software program interfaces with CPCI 01 (Radar Data Acquisition Status and Control (RDASC) program), CPCI 04 (Product Display Program), and the operating system software.

SECTION 1.6. CONSUMABLES/EXPENDABLES

The listing of consumables/expendables required for RPG Group and MCSF Group maintenance is:

General housecleaning:

- Cleaner, glass (Windex or equivalent)
- Cloth, lint-free
- Detergent, Liquid

Printer, Color (Tektronix):

- Laser Paper, 8 1/2 x 11 inches
- Black Ink Cartridge (High Capacity), Tektronix P/N O16-1803-01 or equivalent
- Cyan Ink Cartridge (Standard), Tektronix P/N O16-1804-OO or equivalent
- Magenta Ink Cartridge (Standard), Tektronix P/N O16-1805-OO or equivalent
- Yellow Ink Cartridge (Standard), Tektronix P/N O16-1806-OO or equivalent

Iomega Jaz Disks	2 Gigabytes Storage Disk, Read Many, Write Many Available through GSA.
------------------	---

3.5 Inch Diskettes	1.44 MB Storage Diskettes
--------------------	---------------------------

CHAPTER 2

OPERATIONS

SECTION 2.1. INTRODUCTION

2.1.1 General.

Chapter 2 contains descriptions of the MSCF Group. It provides information on procedures, controls and indicators and gives the user an understanding of the overall operations and tasks performed in the RPG.

2.1.2 Chapter Organization.

This chapter is organized into sections as follows:

- Section 2.1. - INTRODUCTION
- Section 2.2. - MASTER SYSTEM CONTROL FUNCTION (MSCF)
- Section 2.3. - HUMAN COMPUTER INTERFACE (HCI)
- Section 2.4. - LOGIN/LOGOUT PROCEDURES
- Section 2.5. - LOADING SOFTWARE, BACKING UP SOFTWARE, EMERGENCY RECOVERY PROCEDURES
- Section 2.6. - BASE DATA
- Section 2.7. - REDUNDANT CONTROL
- Section 2.8. - HELP
- Section 2.9. - SECURITY
- Section 2.10. - SYSTEM BACKUP

I

SECTION 2.2. MASTER SYSTEM CONTROL FUNCTION

2.2.1 Introduction.

The MSCF hardware consists of a Sun Microsystems Ultra 5 computer and a Sun 21 inch monitor with a separate keyboard and mouse. The MSCF is connected to the RPG processor in a variety of different configurations and is used to control the WSR-88D System to include mode selection, modification of RPG adaptation data, setting of product generation lists, control of communications lines, archive functions, monitoring of RPG and RDA status, alarm, and performance data, and performing maintenance functions. The software used to exercise this control is the HCI. This section describes the various MSCF configurations, the terminal display, and some unique keyboard and mouse functions.

NOTE

This section will discuss some graphical manipulations using a mouse. The word “click” indicates a standard single left mouse click. When a right, middle, or double-click is required, it will be specifically indicated. The word “drag” indicates a standard left mouse click and hold while moving the mouse pointer at the same time. Dragging can be used to move a window, highlight text, or make a menu selection.

2.2.2 MSCF Configurations.

The MSCF has two different configurations to meet the unique needs of each WSR-88D field site. The configurations are called Local and Distant, and each one contains a device called a Router that is located in the RPG cabinet. The following paragraphs describe each of the two configurations.

2.2.2.1 Local MSCF. The Local MSCF configuration is a cable connection from the Router to the MSCF processor that is located locally within the same building. (For additional information see paragraph [1.3.5.1](#))

2.2.2.2 Distant MSCF. The Distant MSCF configuration provides for a connection from the Router to the MSCF processor because the MSCF processor is located away from the building that contains the RPG cabinet. This link is provided through either a dedicated MSCF modem and RPG modem or frame relay service with a frame relay hub router at the associated NWS site. (For additional information see paragraph [1.3.5.2](#), Distant MSCF)

2.2.3 Display.

The RPG Applications Software and other graphical applications are displayed on the MSCF terminal in a format that is used universally by many different computer vendors called the Common Desktop Environment (CDE). This section contains descriptions of these various displays that are seen on the MSCF terminal.

2.2.3.1 Common Desktop Environment (CDE). The CDE is a Graphical User Interface (GUI) that is designed to make UNIX easier for users. CDE is automatically started as part of a normal boot process and is configured to run in a multi-user, networked environment. To help the user organize and manage work, CDE provides windows, workspaces, controls, menus, and the Front Panel.

2.2.3.1.1 Windows. Windows contain software applications and are framed with controls that allow the user to move them, re-size them, or place them in other workspaces.

2.2.3.1.2 Workspaces. Workspaces are the areas of the window where the user places one or more windows that are needed to perform their current work.

2.2.3.1.3 Controls. Controls enable the user to manipulate objects, select choices, or type information. A more detailed description of the controls used in the HCI windows is found in paragraph 2.2.4.1.8.

2.2.3.1.4 Menus. Menus provide access to commands which the operator uses to manage windows and operate applications. This includes the customized Workspace Menu which is described in paragraph 2.2.4.1.9.

2.2.3.1.5 Front Panel. The Front Panel is the horizontal window located at the bottom of the display in every workspace (Figure 2-1). It is a collection of controls which represent frequently used applications.



Figure 2-1. Front Panel

The Front Panel can be customized, but by default contains the controls listed below. The following terms are used to describe the functions of the Front Panel controls:

- Indicator: What the image of the control represents.
- Click: What happens when the control is clicked once with the left mouse button.
- Drop: What happens when a file icon is dragged and released onto the control.
- ▲: What happens when the Up Arrow above the control is clicked.



EPSS (Electronic Performance Support System)

Indicator: Represents the presence of the EPSS program on the system.

Click: Starts the EPSS.



Clock

Indicator: Displays the current local time.

Click: Starts the default web browser.

▲: Displays the Links pop-up window with the following selections:

- Web Browser
- Personal Bookmarks
- Find Web Page



Calendar

Indicator: Displays the current date.

Click: Starts the Calendar application. If the Calendar application is already running, its window is raised to the top of the window stack.

Drop: Schedules the dropped appointment on the correct date in the calendar.

▲: Displays the Cards pop-up window with the following selections:

- Current Date
- Find Card



File Manager

Click: Opens a File Manager view of the home folder.

Drop: Opens a File Manager view of the dropped folder.

▲: Displays the Files pop-up window with the following selections:

- Home Folder
- Removable Media Manager
- Open Floppy
- Properties . . .
- Encryption . . .
- Compress File
- Archive
- Find File



Personal Application (Text Editor)

This control position is reserved for a personal application of the user's choice.

A personal application can be placed here by first installing the application's icon into the Personal Applications subpanel, and then using the control's pop-up menu to place that icon on the front panel.

Click: Starts the Text Editor application.

Drop: Opens the dropped file in a new Text Editor window.

▲: Displays the Applications pop-up window with the following selections:

- Text Note
- Text Editor
- Voice Note
- Applications



Mail

Indicator: Indicates the arrival of new mail.

Click: Starts the Mailbox. If Mail is already running, its window is raised to the top of the window stack.

Drop: Opens the dropped file's contents in the Mailer's Compose window.

▲: Displays the Mail pop-up window with the following selections:

- Mail
- Suggestion Box



Lock

Click: Locks the workstation, preventing unauthorized input.



Workspace Switch

Indicator: Indicates which workspace is currently being displayed.

Click: Displays other workspaces or allows the user to rename the current workspace.



Progress Indicator

Indicator: Spins when the system is running an action.

Click: Opens the Action: Go... window.



Exit

Click: Logs the user out of the current session.



Printer

Click: Opens the Printer Jobs window which displays the status of the default printer, and lets the user cancel print jobs that were sent to that printer.

Drop: Prints the dropped file on the default printer.

▲: Displays the Personal Printers pop-up window with the following selections:

- Default
- Print Manager



Desktop Controls

Click: Starts the Application Manager - Desktop_Controls window. If the Application Manager is already running, its window is raised to the top of the window stack.

▲: Displays the Tools pop-up window with the following selections:

- Desktop Controls
- CDE Error Log
- Customize Workspace Menu
- Add Item to Menu
- Find Process
- Hotkey Editor



Performance Meter

Indicator: Indicates the amount of activity on the Central Processing Unit (CPU) and the system disk.

Click: Opens the Performance Meter window.

▲: Displays the Hosts pop-up window with the following selections:

- Performance
- This Host
- System Info
- Console
- Find Host



Help Manager

Click: Opens a Help Viewer displaying the top level of help.

▲: Displays the Help pop-up window with the following selections:

- Help Manager
- SunSolve Online
- Solaris Support
- Information
- Desktop Introduction
- Front Panel Help
- On Item Help
- AnswerBook2



Trash Can

Indicator: Looks full if it contains deleted files or folders.

Click: Opens the Trash Can window. If the Trash Can window is already opened, it is raised to the top of the window stack.

Drop: Moves the dropped file or folder to the Trash Can.

▲: Displays the Trash pop-up window with the following selections:

- Trash
- Empty Trash Can



Up Arrows

Indicator: Indicates that the Front Panel control immediately below the Up Arrow has an expandable Subpanel pop-up window.

Click: Opens the Subpanel pop-up window of the Front Panel control immediately below the arrow. The Up Arrows and Down Arrows alternately occupy the same space on the Front Panel. Once an Up Arrow is clicked, it becomes a Down Arrow, and once a Down Arrow is clicked, it becomes an Up Arrow.



Down Arrows

Indicator: Indicates that the Front Panel control immediately below the Down Arrow has an expanded Subpanel displayed immediately above the arrow.

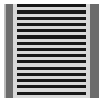
Click: Closes the Subpanel of the Front Panel control immediately below the arrow. The Up Arrows and Down Arrows alternately occupy the same space on the Front Panel. Once a Down Arrow is clicked, it becomes an Up Arrow, and once an Up Arrow is clicked, it becomes a Down Arrow.

**Minimize Button**

Click: Minimizes the Front Panel making it an icon that is labeled with the name of the current workspace.

**Window Menu Button**

Click: Displays the Window Menu of controls that are available for the Front panel. The items in this Window Menu are used to control the Front Panel.

**Move Handles** (Located on both sides of the Front Panel)

Click: Click on either Move Handle, and while holding down the mouse button, drag the Front Panel to move and place it in a new location and then release the mouse button.

For more information about the CDE Front Panel, Subpanels, or Controls, click on the Help Manager's up arrow on the CDE Front Panel and then click on Front Panel Help on the Subpanel.

2.2.4 Graphical RPG Applications Software.

The RPG Applications Software employs a GUI to make the operation of the system easier for the user. The GUI is usually started as part of a normal boot process. To help the user operate and monitor the WSR-88D system, this GUI provides windows, icons, buttons, indicators, color-coding, warning_popups, controls, and the Workspace Menu. The RPG Applications Software process that manages the GUI is called the RPG Human-Computer Interface (HCI).

2.2.4.1 RPG Human-Computer Interface (HCI) Controls. The RPG HCI is the process of the RPG Applications Software that interfaces the user with the RPG computer system. The HCI is automatically started as part of a normal boot process. It displays the RPG HCI window, called the RPG Control/Status Window. See [Figure 2-2, Sheet 1](#) for NWS/DoD sites and [Sheet 2](#) for FAA sites. This window gives the user an overall graphical representation of the current status of the system and provides links to other windows.

For the NWS Redundant configuration, the title bar on top will contain additional information. To the right of the RPG Status/Control title will be (NWS: X) where X is 0 for no wideband link, 1 for RDA Channel 1, or 2 for RDA Channel 2. There are no commands available in the HCI to switch RDA Channels. The remote RDA maintenance terminal will still be the only way to change the RDAs from one to another.

For the FAA Redundant configuration, the title bar on top will contain additional information. To the right of the RPG Status/Control title will be (FAA: X) (where X is 1 or 2, depending upon which channel's HCI was selected), followed by the Active/Inactive status and Controlling/Non-controlling status of that respective channel. It is suggested to pull up both RPG HCIs (one for each separate FAA channel) and view/interact with them both on the computer terminal screen. If there is a disconnect with the communications, the Controlling/Non-controlling status changes to Unknown.

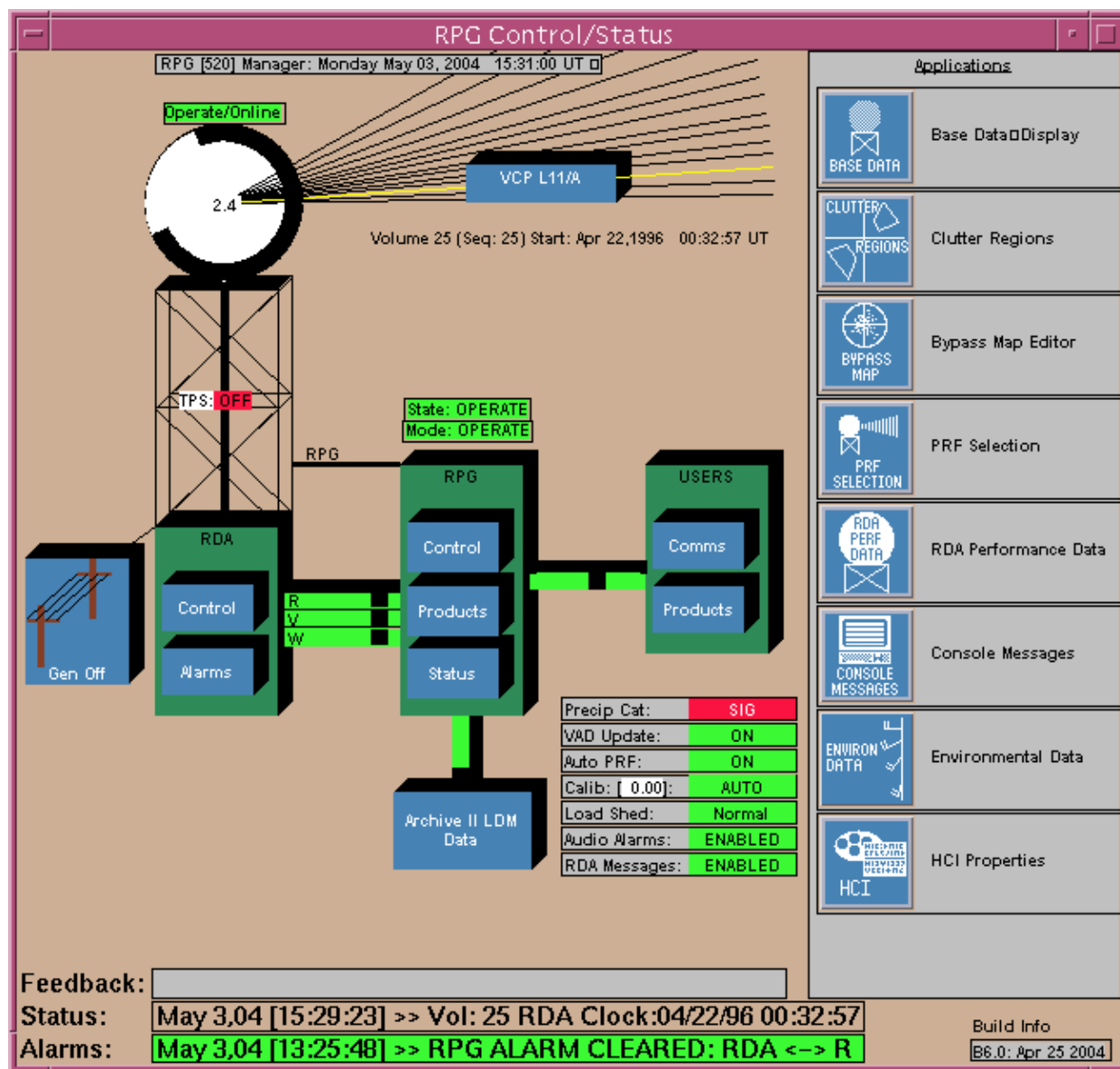


Figure 2-2. RPG Control/Status (HCI) - NWS and DoD sites (Sheet 1 of 2)

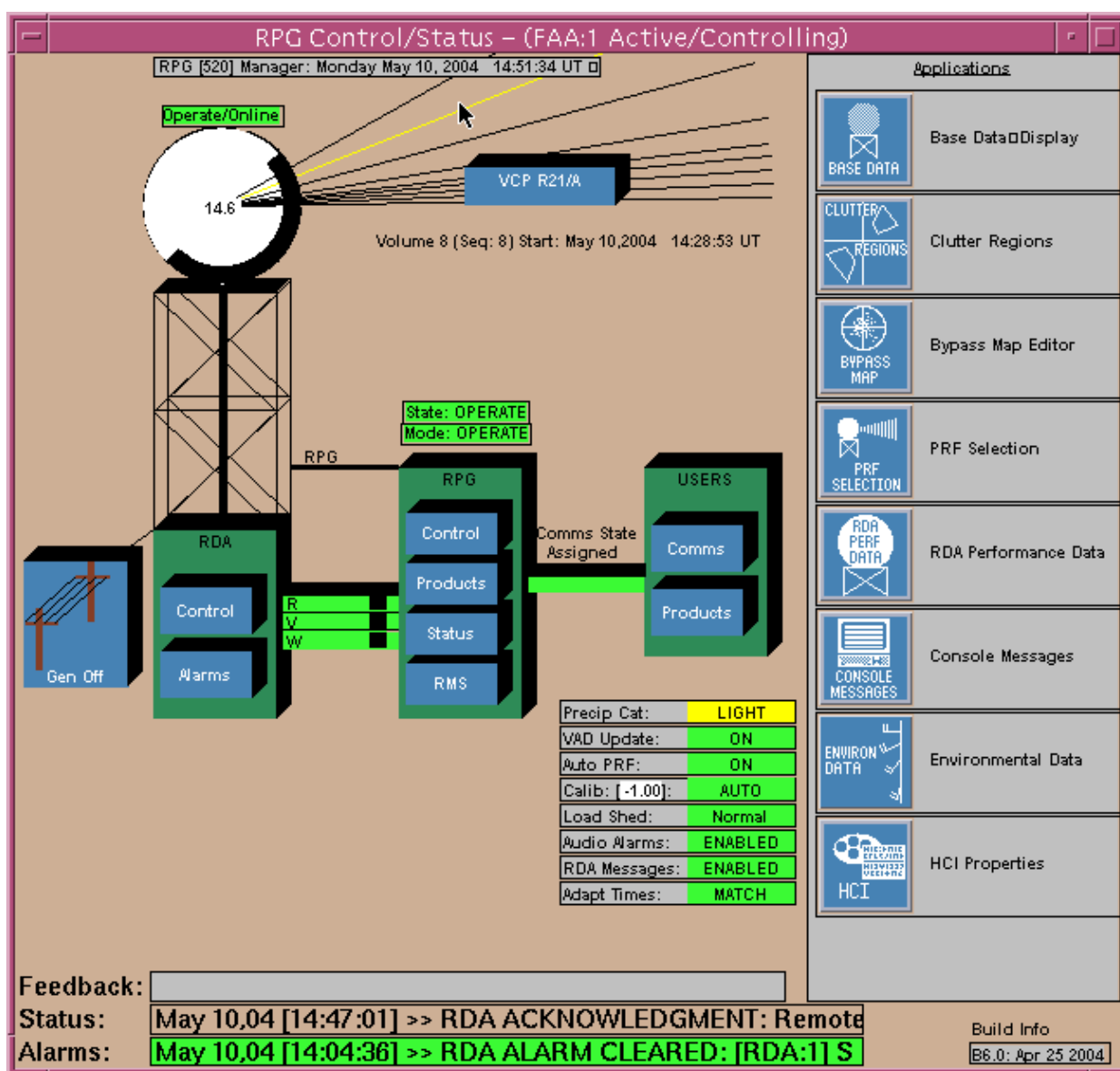


Figure 2-2. RPG Control/Status (HCI) - FAA sites (Sheet 2 of 2)

2.2.4.1.1 Windows. Windows are smaller framed areas within the workspace display that contain different RPG applications software menus. Windows are opened when the user clicks on the appropriate icon or button. Each window has a title bar across the top of it that contains the name of the application. Multiple windows can be opened or displayed at the same time, but only one window at a time can be active. When a window is active, or ready for use, it generally comes to the foreground or the top of the window stack to become fully visible, and its frame becomes highlighted. An inactive window has its frame grayed-out. To change the active window from one window to another, click anywhere within an inactive window.

NOTE

To avoid making an unwanted selection at the same time, click somewhere in the inactive window that does not contain any buttons or icons, like the title bar.

2.2.4.1.2 Icons. In an HCI window, icons are small graphical representations, or pictures that either symbolize other windows or individual components of the WSR-88D system. Some HCI windows can be minimized which essentially turns them into icons and moves them over to the left side of the window. Those windows that can be minimized will have two small buttons in the upper right hand corner of the window, one containing a small square and the other containing a large square. Clicking on the small square turns the window into an icon. Clicking on the large square expands the window. The icon will appear with either a generic design or a variety of text strings in the middle, with an abbreviated text string from the original window on the bottom title bar. To reopen the window, click on the icon and a drop down menu appears. Click the Restore option and the window is restored to its original size and becomes the active window on the HCI.

NOTE

For frequently used windows, it is recommended to minimize the windows to icons instead of closing them each time. This reduces the length of time to reopen the window. This could be especially helpful when a site has a low bandwidth configuration. Windows such as the RPG Status and the Product Distribution Comms Status would be good choices to reduce as icons when not in use.

Other icons that are used routinely to open windows are found along the right hand side of the window in the area called Applications. These icons represent windows which are frequently used in the everyday operations and maintenance of the system. Click on these icons (when the pointing hand appears) and the respective window opens. If these windows are minimized, they appear as new icons along the left hand margin. If these windows are closed, they return to the Applications area of icons in their previous location.

A third use of icons are located on the HCI window itself. The Tower, Radome, RDA, and RPG icons represent the existence of these components in the WSR-88D configuration, but clicking on any of these icons do not open up any windows. Notice that there is no pointing hand when the cursor is moved over these display-only icons.

2.2.4.1.3 Buttons. Buttons are contained within the HCI windows and are used to execute commands or select different configuration options. Buttons are labeled with the name of the associated command or configuration option. Throughout the numerous HCI windows, several different types or styles of buttons are present such as rectangles, dots, or squares. Generally speaking, clicking on a button executes a command.

2.2.4.1.3.1 Sensitized Buttons. When a button has solid black lettering and is described as sensitized, that means the button is enabled in the software and will respond to a mouse click or Return key or Space Bar input.

2.2.4.1.3.2 Desensitized Buttons. When a button's lettering is grayed-out and is described as desensitized, that means the button is not enabled in the software and will not respond to any clicking on the mouse or keyboard stroke.

2.2.4.1.4 Indicators. An indicator is used to display information and it offers no additional functionality to the user. A few examples of where indicators are used in the HCI windows are the VCP elevation angle display, the antenna azimuth position display, the system status line (directly above the radome) on the HCI, and the RDA status information that is displayed at the bottom of the RDA Control window.

2.2.4.1.5 Color-coding. Different colors are used throughout the various windows of the HCI to indicate different categories, deltas, selections, and statuses, along with the traditional use associated with meteorological data.

The overall color scheme of the HCI follows a few simple rules:

- Blue - Buttons invoking commands/menus
- Orange - Signifies Major Alarms
- Yellow - Signifies Minor Alarms
- Green - Normal Operations
- Other - Highlights
- Red - Inoperable

Within some windows, the same item may have the capability of being displayed in two or more different colors. This makes it easier for the user to distinguish when a change has occurred within a window as opposed to changing some text. For example, on the HCI Main Menu, [Figure 2-2](#), there is a Status Area near the lower right hand corner of the window that includes a line called Precip Cat:. Depending on the category of precipitation detected by the radar, this line can display the word NONE in green, LIGHT in yellow, or SIG in red. More specifics of color-coding and how it is used in the HCI are included in the detailed descriptions of each individual window in [Section 2.3](#).

2.2.4.1.6 Warning Popups. Any time the user clicks on an HCI button that issues a command which changes the state of the system, a yellow warning_popup window opens prior to that command being executed ([Figure 2-3](#)). This window essentially reminds the user of the selection that was made, and informs the user about how the state of the system will change. If necessary, it will also inform the user if the change will occur at the beginning of the next volume scan. The yellow warning_popup window also contains the question “Do you want to continue?”, and offers a Yes and a No button which gives the user the option of proceeding with or cancelling the selection. When the No button is clicked, the yellow warning_popup window disappears, essentially returning the user back to the previous window without executing any command. When the Yes button is clicked, the yellow warning_popup window disappears, and the selected command is then executed.

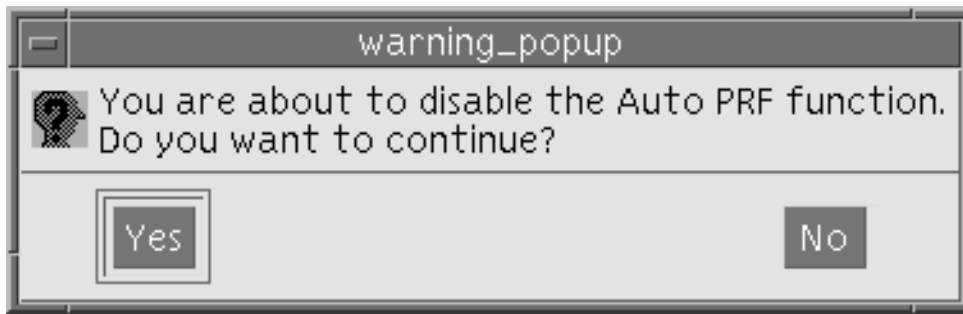


Figure 2-3. Warning_Popup

If the warning_popup provides information only and does not require a Yes or No decision but only needs to allow the user to continue, there will be a Continue button under the text string that the user must click on in order to continue the process. This mostly occurs where an invalid entry has been made in an edit field, and the warning_popup informs the user of the incorrect value and the valid range. See [Figure 2-4](#).

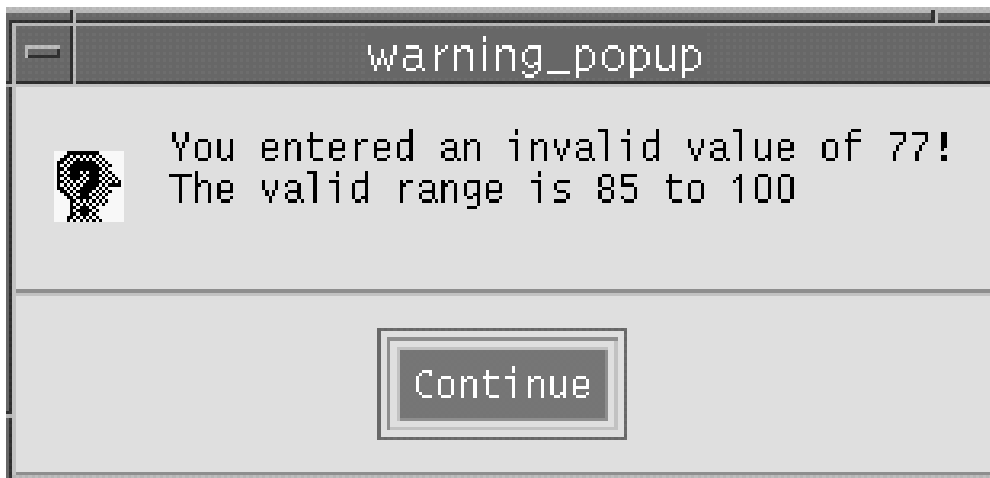


Figure 2-4. Warning_Popup with Continue button

2.2.4.1.7 Password Window. When a window is password protected, a small closed padlock will appear in the upper right hand corner of the window. In order to open the editable fields of the window, the user must first enter the correct password. Click on the closed padlock, and the Password window opens ([Figure 2-5](#)).



Figure 2-5. Password window

There is a Close button in the upper left hand corner that, when clicked, closes the Password window, desensitizes the editable fields, and returns the user to the initial window.

The second line has three choices of Level Of Change Authority (LOCA) available to the user: Agency, Radar Operations Center (ROC), and Unit Radar Committee (URC). Click on either the button to the left of the desired LOCA or the name of the LOCA itself. The button changes to white, a red outline frame appears around the selected LOCA, and the editable fields of the initial window turn to white.

Move the cursor to the edit box just right of the title Password: and click; a blinking cursor appears in the left margin of the edit box. Type in the correct password and press the Return key. The fields in the original window that are editable are now sensitized and available for edits. The Password window disappears and the padlock turns to red and is opened with the LOCA identified next to the padlock. The Baseline: Restore and Update buttons, if in the original window, are now sensitized.

If an incorrect password is entered and the Return key pressed, a warning_popup appears that states: "Invalid password entered!" with a Continue button. Click on the Continue button and the user is returned to the Password window to enter another password.

To close the editable fields of the original window, click on the open padlock in the upper right hand corner. The padlock returns to the closed figure, the editable fields are desensitized, and the user is returned to the initial window. If the open padlock is clicked and any unsaved edits are detected, a warning_popup will appear. One example of a warning_popup is: "Do you want to save the changes you made to the XXX?", where XXX represents the window the operator was editing. Click Yes to save all edits and lock the window. Click No to discard all edits and lock the window.

If a LOCA does not have edit permission in a window, then that LOCA will not appear in the Password window. There will not be a title or control button available for that LOCA.

In the algorithms section, there is an even greater limitation. If the URC LOCA is not authorized for a particular algorithm, that algorithm will not be available on the pull-down menu.

2.2.4.1.8 Controls. All of the HCI windows, including those that may have been minimized into icons, contain controls that allow the user to manipulate them in a number of different ways. Some of these controls are also imbedded within the window frame allowing the user to use them with the mouse. All of the HCI window controls are listed and described below, but not all of them are available in every HCI window. Clicking (left or right) on the Window Menu Button in the upper left hand corner of the HCI window frame (or icon if the HCI window has been minimized) will display a menu of controls that are available for that window or icon (Figure 2-6). The right click can be done anywhere on the window frame or icon and does not turn an inactive window or icon into an active one. Menu controls which are grayed-out are not available for selection. Changes that are made to the HCI windows using these controls are temporary and only last until the window is either closed or the RPG applications software is stopped. Any time an HCI window is opened, it uses the default control settings for that window. The controls (with alternate key strokes when available) are:

- **Restore (<Alt><F5>)** - Restores a window to its previous size and location if it had been maximized. This also restores an icon back to a window of its previous size and location. This will appear grayed-out if the window is not maximized or minimized. The same functionality exists by either double-clicking on an icon, or by clicking on the Maximize Button a second time.
- **Move (<Alt><F7>)** - Places a special mouse pointer in the center of the window or icon, and then by moving the pointer with the mouse, it allows the user to move the window or icon to another location on the same workspace. A thin outline of the window or icon frame is displayed to assist the user until it is placed in its new location by clicking on the left or right mouse button. The same functionality exists by dragging either the title bar of the window or anywhere on the icon.
- **Size (<Alt><F8>)** - For the HCI windows that allow it, this places a special mouse pointer in the center of the window, and then by using the mouse to move the pointer outside the frame of the window, it allows the user to change the size of the window. A thin outline of the new window frame is displayed to assist the user until it is placed in its new position by clicking on the left or right mouse button. The same functionality exists by dragging any of the four corners or four sides of the window frame. This will appear grayed-out if the window has been minimized. However, many of the HCI windows have fixed sizes and do not allow this type of control even when this doesn't appear grayed-out. In addition, some of the HCI windows that do allow this do not resize the text within the window to fit the new frame size. So if the user makes an HCI window smaller, then some of the text may not be displayed. Except for the HCI windows that do fully support this type of control, like the Main Menu, it is better that the user doesn't change the size of any HCI windows.
- **Minimize (<Alt><F9>)** - For the HCI windows that allow it, this turns the window into an icon. The icon is placed on the left side of the window and given a label of HCI with the specific name of the HCI window displayed within the icon. This will appear grayed-out if the window has already been minimized. The same functionality exists by clicking on the Minimize Button which is the second button from

the right in the upper right hand corner of the window frame. To restore the window to its previous size and location, the user can either double-click on the icon, or select Restore from the icon's HCI Window Menu.

- Maximize (<Alt><F10>) - For the HCI windows which allow it, this enlarges the window or icon to its greatest size. This will appear grayed-out if the window has already been maximized. Some HCI windows can be enlarged to fill the entire size of the terminal display while others have a fixed size and cannot be enlarged beyond that. The same functionality exists by clicking on the Maximize Button which is the first button on the right in the upper right hand corner of the window frame. To restore the window to its previous size and location, the user can either click on the Maximize Button again, or select Restore from the HCI Window Menu.
- Lower (<Alt><F3>) - If other windows or icons are on the workspace, this moves the window or icon to the background, or lowers it to the bottom of the window stack (When two or more windows are open, they overlay each other and are called a window stack.). This does not cause an active window or icon to become inactive. To bring the window or icon back to the foreground, or raise it to the top of the window stack, click anywhere on its frame or title bar. Similar functionality exists by clicking anywhere on or inside the frame of another window or icon. However, this action will move the newly selected window or icon to the top of the window stack and make it active. The previously active window or icon does not drop all the way down to the bottom of the window stack, but just one level below the newly active window.
- Occupy Workspace... - This allows the user to select the workspace in which the window or icon will be displayed. Clicking on it opens up the Occupy Workspace dialog box ([Figure 2-7](#)) described below. Only one of these dialog boxes can be opened at a time. Attempting to open a second one automatically closes the first one.
 - Window:/Icon - Displays the name of the window or icon that the Occupy Workspace dialog box originated from and applies to.
 - Workspaces - Lists the name(s) of the available workspace(s) from which the user may select. When the Occupy Workspace dialog box is initially opened up, the name(s) that are already highlighted indicate the name(s) of the workspace(s) where the window or icon is already being displayed. To select a single workspace, click on its name and it will become highlighted if it wasn't already. If other workspace names were already highlighted, they will become unhighlighted. To select more than one workspace, either click and drag the mouse over contiguous workspace names, or hold down the CTRL key while clicking on discontinuous workspace names.
 - All Workspaces - When clicked on once, a check mark opens in the box and all of the workspace names become highlighted indicating that the window or icon will be displayed in all workspaces. The same functionality exists by selecting Occupy All Workspaces from the HCI Window

- Menu. When clicked on again, the check mark disappears from the box, and only the top name on the workspace list will be highlighted.
- OK - Applies the currently selected workspace settings and closes the dialog box.
 - Cancel - Restores the previous workspace settings and closes the dialog box.
 - Help - Displays the Occupy Workspace Dialog Box help topic within the Workspace Manager - Help window.
 - Occupy All Workspaces - Displays the window or icon in all workspaces.
 - Unoccupy Workspace - Removes the window or icon from the current workspace. This will appear grayed-out if the window or icon is only present in the current workspace.
 - Close (<Alt><F4>) - Closes the window or icon, removing it from the workspace. The same functionality exists by double-clicking on the Window Menu Button in the upper left hand corner of the window frame.

<u>R</u> estore	Alt+F5
<u>M</u> ove	Alt+F7
<u>S</u> ize	Alt+F8
M <u>i</u> nimize	Alt+F9
Ma <u>x</u> imize	Alt+F10
<u>L</u> ower	Alt+F3
<u>O</u> ccupy Workspace...	
Occupy <u>A</u> ll Workspaces	
<u>U</u> noccupy Workspace	
<u>C</u> lose	Alt+F4

Figure 2-6. HCI Window Control

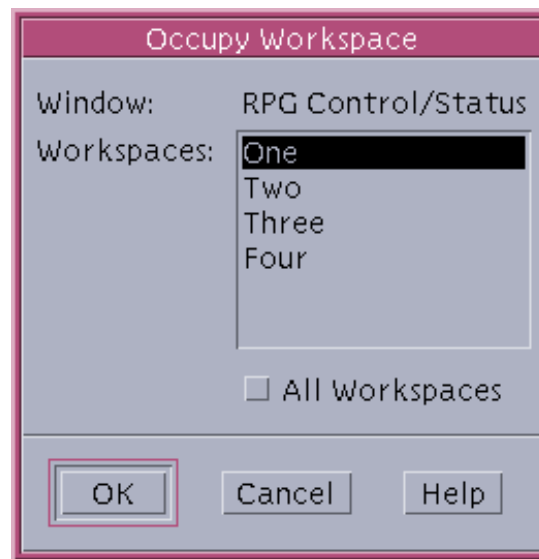


Figure 2-7. Occupy Workspace Dialog Box

2.2.4.1.9 Workspace Menu. The Workspace Menu is a list of items used to manage the workspace and which contains submenus used for starting applications and other workspace functions. Some of these functions can also be invoked from the CDE Front Panel or its subpanels. The Workspace Menu is available in all workspaces and is opened by right clicking anywhere on the workspace background (i.e. outside of all application window and icons). An arrow next to a menu item indicates that the item has a submenu. To open a menu item's submenu, click on the arrow. Clicking on any Workspace Menu or submenu item selects the item and closes the Workspace Menu. To close the Workspace Menu without selecting an item, move the mouse pointer anywhere off of the menu and click. As is the case with the RPG, the Workspace Menu can be customized to better fit the needs of the user. Additional information on the Workspace Menu is available from the site's System Administrator and the Sun workstation manuals.

The following listing is an example of a typical Workspace Menu (Figure 2-8.) The ► represents the arrow indication that there is a submenu.

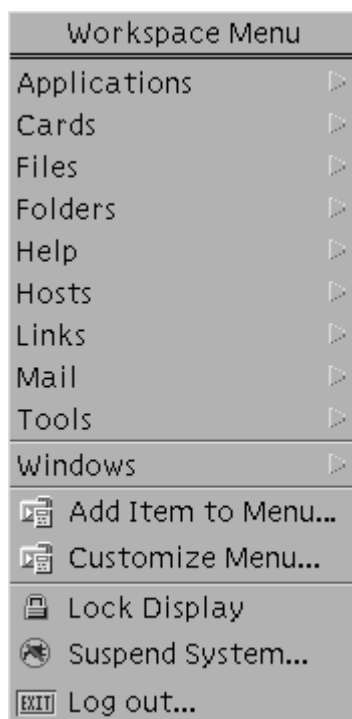


Figure 2-8. Workspace Menu

2.2.5 Keyboard Usage.

The alphanumeric keyboard has a number of different types of keys used to enter and/or manipulate alphanumeric data on the HCI. These key types are described in the following sections. Refer to [Figure 2-9](#), for the locations of each key type.

Certain keys, as noted below, have an “auto repeat” feature. When a character is depressed for at least one second, the terminal generates a stream of that character at a rate of 15 characters per second until the key is released.

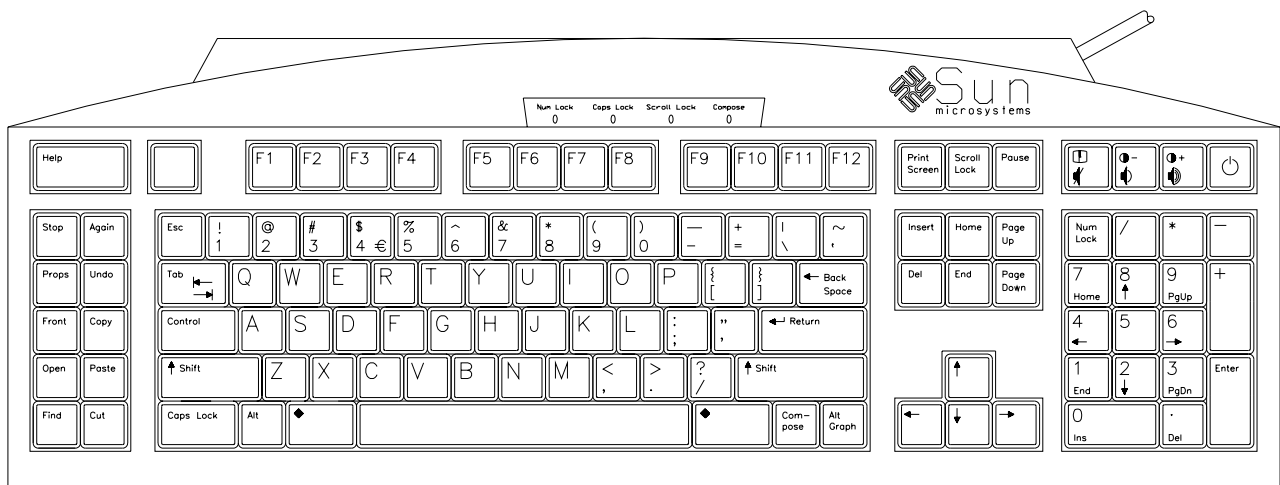


Figure 2-9. Keyboard

2.2.5.1 Alphanumeric Keys. The alphanumeric keys have the auto repeat feature. When the cursor is positioned within an unprotected field, depression of an alphanumeric key will cause the corresponding character to replace any character currently at that location. The cursor will then be automatically repositioned at the next unprotected character on the window. In order to transfer over to the next subfield, either tab over or use the mouse and click in the new desired subfield. On the keyboard, the numeric keys each contain two symbols. The lower symbol is the character displayed by depressing the key. The upper symbol is the character displayed by depressing the key in conjunction with either one of the two Shift keys. The alphabetic keys are normally displayed in lower case by depressing the desired keys. The corresponding uppercase alphabetic characters are displayed by depressing the desired keys in conjunction with one of the Shift keys. Use the Cap Lock key to facilitate typing a string of uppercase characters.

2.2.5.2 Space Bar. While the alphanumeric keys operate in a manner very similar to a typewriter, the Space Bar is an important exception. The Space Bar actually produces a blank character which replaces whatever is currently at the cursor location. Therefore, the mouse or the cursor control keys must be used to nondestructively skip over window data. In addition, when using the Tab key to move from one unprotected subfield to another, pressing the Space Bar will activate the newly selected subfield. The Space Bar has the auto repeat feature.

Another feature of the Space Bar is that it can toggle on or off the latest window that has been opened from the HCI. For example, from the HCI, click on the RDA Control button. The RDA Control window appears. Now press on the Space Bar, and the RDA Control window disappears. Press on the Space Bar again, and the RDA Control window reappears.

2.2.5.3 Return Key. Prior to depressing the Return key, the operator can use the alphanumeric keys, editing keys, the numeric keypad, and certain auxiliary operation keys to enter/alter characters in the unprotected areas of the window in order to format the command or data. Upon completion of such enter/alter operations, depression of the Return Key causes the data on the window to be interpreted.

2.2.5.4 Cursor Control Keys. Certain keys facilitate the movement of the cursor without intervention of the HCI software, and without altering the contents of the alphanumeric window. These cursor control keys include Cursor Movement, Tab, Home, Page Up, and Page Down. All cursor control keys except for Home have the auto repeat feature.

2.2.5.4.1 Cursor Movement Keys. The cursor movement portion of the keyboard consists of the Home key and four keys labeled with arrows for each 90 degree direction of a full 360 degree circle. The four keys hereinafter are referred to as Arrow keys.

NOTE

The Arrow keys move the cursor throughout the various unprotected areas of the window, but not always in the expected direction. Depending upon the arrangement of the unprotected areas, there may not be any vertical movement of the cursor, even though the vertical movement arrow keys are depressed.

2.2.5.4.2 Tab Key. The Tab key can be operated with or without the Shift key. When the Tab key is depressed unshifted, the cursor moves to the right to the next unprotected area of the window. This is in a horizontal direction until no more unprotected areas remain on that line. Then the cursor is moved to the first unprotected area of the next line down.

NOTE

When entering data in two columns, the cursor shifts from column to column and then down a line, not down one column in a numerically logical sequence. If there are no unprotected areas between the current cursor location and the end of the window, the cursor is moved to the first position of the first unprotected area on the window. When the Tab key is depressed in conjunction with the Shift key, the cursor moves to the left to the first position of the previous unprotected field. If the cursor is currently in the first position of the first unprotected field, it goes to the last position of the last unprotected field on that window.

2.2.5.4.3 Home Key. The Home key moves the cursor to the left most position of the first unprotected area of the window. However, it does not function on many of the HCI windows.

2.2.5.4.4 Page Up/Page Down Keys. The Page Up/Page Down keys function when there are multiple pages of information on the HCI window. One complete page at a time is scrolled forward (for Page Up) or backwards (for Page Down). If there is just one page of information, then the Page Up/Page Down keys do not function.

2.2.5.4.5 Back Space Key. The Back Space Key moves the cursor one space at a time to the left, deleting any alphanumeric entry that may have existed in each space. This key has the auto repeat feature.

2.2.5.5 Insert Key. The Insert key is a toggle for entering alphanumeric data. When toggled on, the Insert key allows the data to be entered without overwriting the existing information. It advances the cursor with each keystroke and advances the existing information. When toggled off, any keystroke entry writes over the existing information, advances to the next location, and does not advance the existing information.

2.2.5.6 Delete Key. The Delete key is used to delete the alphanumeric character on which the cursor is blinking on any unprotected field. If the operator wants to delete a series of alphanumeric characters, then click, and drag to highlight the characters desired, then press the Delete key. The Delete key has the auto repeat feature.

2.2.5.7 Numeric Keypad. The numeric keypad is located in the lower right portion of the keyboard and consists of the Return key and a full set of numeric keys, including a minus sign, a plus sign, an asterisk sign, a back slash, a decimal, Delete (Del) key, Insert (Ins) key, Home key, End key, Page (Pg) Up and Page (Pg) Down keys, four Arrow keys, and a Number (Num) Lock key. This keypad is provided to facilitate numeric data entry for people who are proficient at operating adding machines. The number keys on this keypad operate the same as the unshifted number keys at the top of the alphanumeric keyboard. The decimal, plus, minus, asterisk, and back slash keys all operate the same as the regular entries from the alphanumeric keyboard.

The Num Lock key acts as a toggle switch. When the Num Lock is engaged, the numbers, decimal, plus, minus, asterisk, and back slash keys function regularly. However, the Home, End, Page Up, Page Down, Delete, Insert, and four Arrow Keys all require the shift key be depressed at the same time. When the Num Lock is not engaged, then just the other functions work. The state of the Num Lock key is indicated by the Num Lock indicator at the upper portion of the keyboard. When the light is on, the Num Lock is engaged. When the light is off, the Num Lock is not engaged. All keys on the numeric keypad have the auto repeat feature.

2.2.5.8 Shift Keys. There are two Shift keys, one on either side of the alphanumeric keyboard. These keys do nothing when used alone, but are used in conjunction with other keys to increase the number of actions which a single key can perform. The two Shift keys operate identically. The effect of using Shift in conjunction with any given key is described in the section pertaining to the particular key.

2.2.5.9 Capital Lock. When the Capital Lock (Caps Lock) key is pushed and the light is illuminated, then all the alphabetical keys are entered as upper case letters. When pushed again, the light is turned off and all alphabetical keys are entered as lower case letters.

2.2.5.10 Power On/Off Key. In the upper right hand corner of the keyboard is a Power On/Off key. Its original function has been desensitized and no longer acts as a Power On/Power Off key. It does give the operator a "...v..." character in the terminal window when pressed, but does nothing else. To power off any portions of the system, it is recommended that the operators use only

the windows available through the HCI. The technicians, with their maintenance training, should use the more intensive shutdown options available in the MSCF and the Terminal windows (with keystroke commands).

2.2.6 Mouse.

The MSCF mouse is a product of Sun Microsystems and has three buttons. In the WSR-88D RPG configuration, the MSCF processor will always have its own keyboard, mouse, and terminal, while the RPG processor will only have its own keyboard, mouse, and terminal if there is no BDDS installed on the system. In that configuration, the RPG processor and the BDDS processor share the same keyboard, mouse, and terminal. The on-line Help Manager that is available from the CDE Front Panel refers to the three mouse buttons as one, two, and three. This manual refers to the same buttons as left, middle, and right respectively. Each mouse button can be used in the standard click, double-click, or drag functions. The mouse's orientation can be changed from right-handed to left-handed by using the Style Manager available from the CDE Front Panel (Tools pull-up menu, Customize Workspace Menu, Tools, Style Manager, Mouse). This section refers to the buttons as they are oriented for right-handed operation. The following paragraphs list and describe some of the most common, unique, and helpful functions that are available for each mouse button.

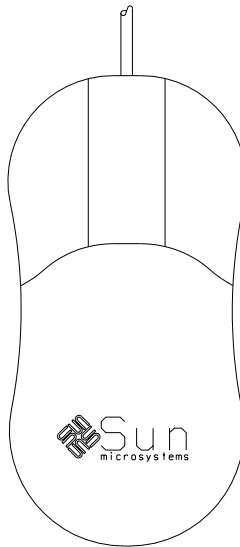


Figure 2-10. Mouse

2.2.6.1 Left Mouse Button. The MSCF and HCI are designed to be operated primarily with a mouse, with the keyboard used only to enter in data, modify parameters, or to describe search titles. The majority of the actions will be taken using the left mouse button (for the right handed

operator). The types of task that can be performed by clicking the left mouse button once include the following:

- Selecting a window or an icon, making it active.
- Choosing a button or a hyperlink within a window or a control on the Front Panel.
- Choosing an item within a window.
- Selecting a secondary window by positioning the cursor until the pointing hand indicator or the cursor opens over the desired task.
- Selecting a task or an action by clicking on the correct response.
- Pulling down a screen by selecting the correct arrow.
- Closing windows.

NOTE

The word “click” in the text of this manual indicates a standard single left button click. When a middle click, right click, or double click is required, it will be specifically indicated.

The types of tasks that can be performed by double-clicking the left mouse button include the following:

- Restoring a minimized icon into a window.
- Closing a window (Double-click on the Window Menu button in the upper left hand corner of the window frame.

The types of tasks that can be performed by dragging with the left mouse button include the following:

- Moving a window or an icon by positioning the cursor over the top title bar and dragging the mouse with the left mouse button pressed.
- Highlighting text.
- Making a menu selection.
- Dragging a vertical slider bar within a window's scroll bar to scroll through the window's contents.
- Dragging a horizontal slider bar to expand the width of view of a window.
- Changing the size of a window, either on an edge or on a corner. Some windows allow this feature, others do not. The graphics are resized and repositioned accordingly. However, to preserve the integrity of all the graphics, a minimum window size of 550x400 pixels is maintained.

2.2.6.2 Middle Mouse Button. A task that can be performed by clicking on the middle mouse button include the following:

- Once a text string or a command has been highlighted by dragging over it, pressing the middle mouse button copies and pastes it to the end of the current line.

2.2.6.3 Right Mouse Button. The types of tasks that can be performed by clicking on the right mouse button is:

- Opening the Window Control Menu (Right-click on an icon or anywhere on a window frame.)
- Opening the Workspace Menu (Right-click anywhere on the workspace background.)
- Opening a CDE Front Panel or Subpanel control's popup menu. (Right-click on the control on the CDE Front Panel or Subpanel.)

2.2.6.4 Keystroke Alternatives to Mouse Buttons. When a window is opened, a rectangular outline may appear in the upper left hand corner over a control button or a block of data. This outline can be moved throughout the window using the Tab key to advance the outline first horizontally to the right hand margin and then scroll downwards, one "line" at a time. When the outline surrounds a control button, pressing on the Return key or the Space bar will activate that button, similar to clicking on the button with the left mouse button. When the outline surrounds a block of data, that data may be changed or deleted using the keyboard (assuming any password protection has been properly addressed.)

Once the outline reaches the lower right hand corner of the window, it starts again in the upper left hand corner. To make the outline move backwards, hold the shift key down while pressing the tab key.

2.2.7 MSCF Window.

Once the user has successfully entered the password and logged in to the Solaris system, the system should automatically boot up a Console window, a Terminal window, the MSCF, a Clock, and the CDE front panel. If the MSCF does not appear, go to the Console window and at the " : " prompt, type in "mscf &" and press the Return key. The MSCF window then opens up for access to the rest of the system ([Figure 2-11](#)).

NOTE

If the screen has not been interacted with for a certain time limit, a floating screen saver may appear with the words: "SYNC NOT IN RANGE" in red bold print moving at random around the screen. This is an internal notice from the monitor, and does not require any action by the operator. A simple movement on the mouse and the message disappears. There is nothing wrong with the equipment.

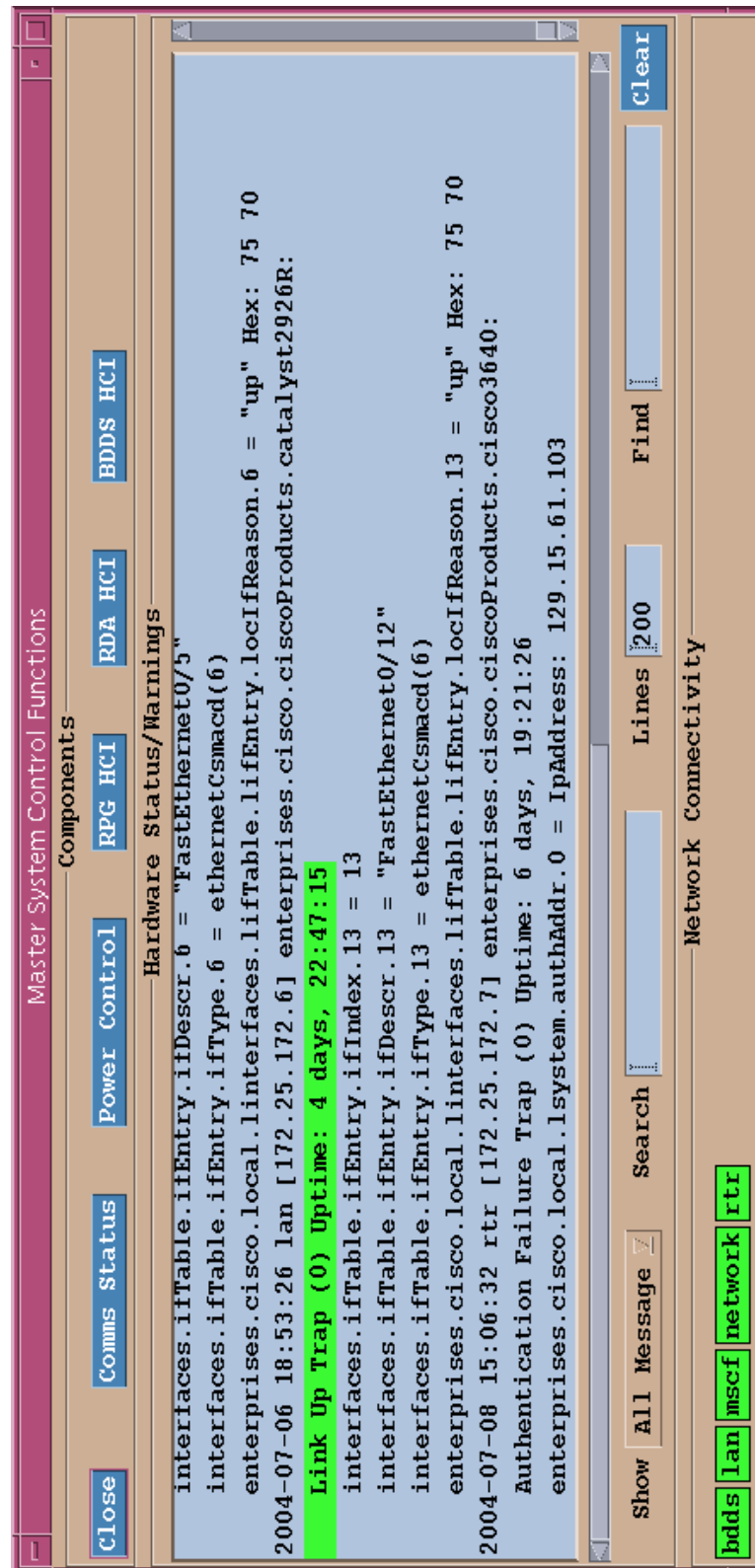


Figure 2-11. MSCF Window

The top row of the MSCF window contains six buttons that provide an interface with the five components and Close button available for selection off of the MSCF. They are: Close, Comms Status, Power Control, RPG HCI, RDA HCI, and BDDS HCI. They are explained below.

2.2.7.1 Close Button. The top row of the MSCF window contains six buttons that provide an interface with the five components. The first button in the upper left is the Close button. Clicking on this button will close the MSCF window and return the user to the terminal window.

2.2.7.2 Comms Status Button. The second button from the left is the Comms Status button. Click on this button and the Comms Status window opens. See [Figure 2-12](#).

Comms Status						
Close		Device	CISCO Switch	Update		
Device Name		OpStatus	CISCO Switch		Type	
Device Name		OpStatus	Description	Collisions	IRReset	
RPG	up(1)	VLAN1	ethernetCsmacd(6)	51746720	0	
	up(1)	FastEthernet0/1	ethernetCsmacd(6)	0	3	
	up(1)	FastEthernet0/2	ethernetCsmacd(6)	0	3	
	up(1)	FastEthernet0/3	ethernetCsmacd(6)	0	3	
To BDDS	down(2)	FastEthernet0/4	ethernetCsmacd(6)	0	3	
	up(1)	FastEthernet0/5	ethernetCsmacd(6)	0	3	
RDA/RPG Gateway	up(1)	FastEthernet0/6	ethernetCsmacd(6)	42	3	
	down(2)	FastEthernet0/7	ethernetCsmacd(6)	0	2	
UPS	up(1)	FastEthernet0/8	ethernetCsmacd(6)	0	3	
	up(1)	FastEthernet0/9	ethernetCsmacd(6)	7	3	
Masterswitch	down(2)	FastEthernet0/10	ethernetCsmacd(6)	0	2	
	down(2)	FastEthernet0/11	ethernetCsmacd(6)	0	2	
From BDDS	up(1)	FastEthernet0/12	ethernetCsmacd(6)	0	3	
	down(2)	FastEthernet0/13	ethernetCsmacd(6)	0	3	
	down(2)	FastEthernet0/14	ethernetCsmacd(6)	0	3	
	down(2)	FastEthernet0/15	ethernetCsmacd(6)	0	3	
BDDS Client 4	down(2)	FastEthernet0/16	ethernetCsmacd(6)	0	3	
	up(1)	FastEthernet0/17	ethernetCsmacd(6)	0	2	
Comm Server B	up(1)	FastEthernet0/18	ethernetCsmacd(6)	0	2	
	up(1)	FastEthernet0/19	ethernetCsmacd(6)	0	2	
Comm Server C	down(2)	FastEthernet0/20	ethernetCsmacd(6)	0	2	
	down(2)	FastEthernet0/21	ethernetCsmacd(6)	0	2	
Test_Port	down(2)	FastEthernet0/22	ethernetCsmacd(6)	0	2	
	down(2)	FastEthernet0/23	ethernetCsmacd(6)	0	2	
Test_Port	down(2)	FastEthernet0/24	ethernetCsmacd(6)	0	3	

Figure 2-12. Comms Status

2.2.7.2.1 Comms Status Window. The button in the upper left is the Close button. Clicking on this button will close the Comms Status window and return the user to the MSCF window.

| The pull-down menu is located just to the right of the Close button. This provides the user with the selection of which device to display on the status window. Click on the down arrow and the menu opens. The options in the pull down menu are: CISCO Switch, CISCO Router, and Router Card Status. Click on the desired device, the title turns to white with a black background, and the status window refreshes itself with the information about that device. Each device displays a variety of information. These are discussed below.

2.2.7.2.1.1 CISCO Switch. This window displays the CISCO Switch Device Name, OpStatus, Description, Type, Collisions, and IReset. The data is color coded with green and gray backgrounds. A green background indicates that the data is Up and a gray background indicates that the data is Down. See [Figure 2-13](#).

Comms Status

Close

Device CISCO Switch Z Update

Device Name	OpStatus	Description	Type	Collisions	IReset
	up(1)	VLAN1	ethernetCsmacd(6)	51746720	0
RPG	up(1)	FastEthernet0/1	ethernetCsmacd(6)	0	3
Printer	up(1)	FastEthernet0/2	ethernetCsmacd(6)	0	3
Router	up(1)	FastEthernet0/3	ethernetCsmacd(6)	0	3
To BDDS	down(2)	FastEthernet0/4	ethernetCsmacd(6)	0	3
	up(1)	FastEthernet0/5	ethernetCsmacd(6)	0	3
RDA/RPG Gateway	up(1)	FastEthernet0/6	ethernetCsmacd(6)	42	3
	down(2)	FastEthernet0/7	ethernetCsmacd(6)	0	2
UPS	up(1)	FastEthernet0/8	ethernetCsmacd(6)	0	3
Masterswitch	up(1)	FastEthernet0/9	ethernetCsmacd(6)	7	3
	down(2)	FastEthernet0/10	ethernetCsmacd(6)	0	2
	down(2)	FastEthernet0/11	ethernetCsmacd(6)	0	2
From BDDS	up(1)	FastEthernet0/12	ethernetCsmacd(6)	0	3
BDDS Client 1	down(2)	FastEthernet0/13	ethernetCsmacd(6)	0	3
BDDS Client 2	down(2)	FastEthernet0/14	ethernetCsmacd(6)	0	3
BDDS Client 3	down(2)	FastEthernet0/15	ethernetCsmacd(6)	0	3
BDDS Client 4	down(2)	FastEthernet0/16	ethernetCsmacd(6)	0	3
Comm Server A	up(1)	FastEthernet0/17	ethernetCsmacd(6)	0	2
Comm Server B	up(1)	FastEthernet0/18	ethernetCsmacd(6)	0	2
Comm Server C	up(1)	FastEthernet0/19	ethernetCsmacd(6)	0	2
	down(2)	FastEthernet0/20	ethernetCsmacd(6)	0	2
	down(2)	FastEthernet0/21	ethernetCsmacd(6)	0	2
	down(2)	FastEthernet0/22	ethernetCsmacd(6)	0	2
	down(2)	FastEthernet0/23	ethernetCsmacd(6)	0	2
Test_Port	down(2)	FastEthernet0/24	ethernetCsmacd(6)	0	3

Figure 2-13. CISCO Switch

2.2.7.2.1.2 CISCO Router. This window displays the router Device Name, OpStatus, Description, Type, Collisions, and IReset. The data is color coded with green and gray backgrounds. A green background indicates that the status is Up and a gray background indicates that the status is Down. See [Figure 2-14](#).

Comms Status

Close

DeviceCISCO Router

Update

CISCO Router

Device Name	OpStatus	Description	Type	Collisions	IReset
RDA-network	down(2)	Serial1/0	propPointToPointSerial(22)	0	13
lan_switch	down(2)	Serial1/1	ppp(23)	0	54613
local_mscf	up(1)	FastEthernet0/0	ethernetCsmacd(6)	0	1
AWIPS LANOP	up(1)	FastEthernet0/1	ethernetCsmacd(6)	0	1
roc_lan	up(1)	FastEthernet1/0	ethernetCsmacd(6)	5	1
Line 37 DEDIC	down(2)	FastEthernet1/1	ethernetCsmacd(6)	135945	1
Line 33 DEDIC	down(2)	Serial2/0	ppp(23)	0	1
Line 34 DEDIC	down(2)	Serial2/1	ppp(23)	0	26
Line 35 DEDIC	down(2)	Serial2/2	ppp(23)	0	2
Line 36 DEDIC	down(2)	Serial2/3	ppp(23)	0	2
Line 38 DIALIN	down(2)	Serial2/4	ppp(23)	0	2
Line 39 DIALIN	down(2)	Serial2/5	ppp(23)	0	2
Line 40 DIALIN	down(2)	Serial2/6	ppp(23)	0	2
	up(1)	Serial2/7	ppp(23)	0	1
	up(1)	Null0	other(1)	0	0
	up(1)	BVI1	ethernetCsmacd(6)	0	0

Figure 2-14. CISCO Router

2.2.7.2.1.3 Router Card Status. This window displays the RouterCard Index, Type, Description, OpStatus, Hardware Version, Slots (On Card), Contained by Index, and Slot Number. See [Figure 2-15](#). The user can review the entire contents by using the arrow controls on the bottom of the window or by dragging the right side of the screen to the edge of the display to expand the right hand margin.

Comms Status									
Close		Device Router Card Status		Update		Router Card Status			
Index	Type	Description	OpStatus	Hardware Version	Slots (On Card)	Contained by Index	Slot Number		
1	cpu-3600(31)	3640	up(2)	0x00	0	0	0		
2	385	FastEthernet/WAN	up(2)	1.0	2	0	0		
3	385	FastEthernet/WAN	up(2)	1.0	2	0	0		
4	370WAN	Interface Card - DSU/CSU T1	up(2)	1.0	0	3	3		
5	370WAN	Interface Card - DSU/CSU T1	up(2)	1.0	0	3	3		
6	pm-8as(276)	Eight Port Low-Speed A/S Serial	up(2)	1.0	0	0	0		

Figure 2-15. Router Card Status

2.2.7.2.2 Update Button. Click on the Update button to refresh and update the particular window the user is looking at. Even if the window has an automatic update feature, this button will still update it with the latest available information.

2.2.7.3 Power Control Button. The third button from the left is the Power Control button. Click on the Power Control button and the Power Control window opens. See [Figure 2-16](#). The purpose of this window is to provide power control to various devices and provide a last resort route to possibly recover equipment by rebooting the power.

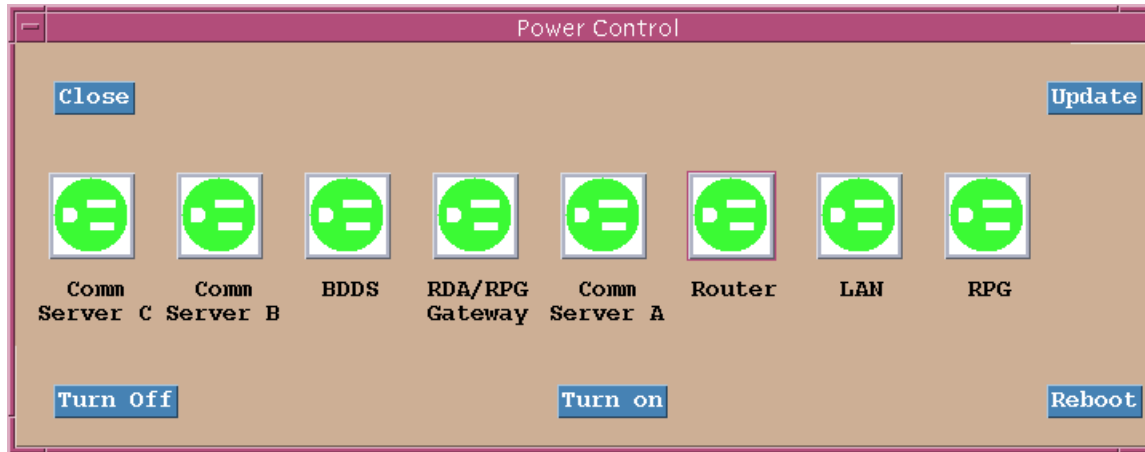


Figure 2-16. Power Control

There are five controlling buttons plus a graphic representation of the power outlets to various devices. The upper left Close button closes the Power Control window and returns the user to the MSCF window. The upper right Update button refreshes the window with the latest information. If the power is on for an outlet, it will have a green outlet with a white background. If the outlet has been clicked on by the user, the background turns to yellow and the connection is now available for modification. If the background is red, then the outlet has been turned off because of hardware power failure, or because it has been commanded to turn off.

The power outlets in this example are, from left to right: Comm Server C, Comm Server B, BDDS, RDA/RPG Gateway, Comm Server A, Router, LAN, and RPG. This arrangement may vary as the hardware evolves.

2.2.7.3.1 Power Control - Turn Off. To turn off an outlet server that is presently on (white), click on the desired outlet (background turns yellow), then click on the Turn Off button in the lower left corner of the window. A warning_popup opens that states: “You are about to turn OFF devices: XXXX. Do you want to continue?” Click on Yes or No. XXXX is the legend for the power connection that was selected. If Yes, the outlet is turned off and the outlet background color changes to red. If No, the user is returned to the Power Control window. If there is no icon selected and the Turn Off button is clicked, a warning popup opens that states: “You need to select the appropriate device(s) by clicking on the connector icon.” Click on the Continue button to return to the Power Control window.

NOTE

The user can only Reboot the LAN, Router, or the Comm Servers A, B, or C. When any of these outlets are selected, the Turn Off/Turn On Buttons become grayed-out and desensitized. The Reboot Button is the only available power control option.

2.2.7.3.2 Power Control - Turn On. To turn on an outlet that is presently off (red), click on the desired outlet (turns yellow), then click on the Turn On button in the middle of the bottom of the window. A warning_popup opens that states: "You are about to turn ON devices: XXXX. Do you want to continue?" Click on Yes or No. XXXX is the legend for the power connection that was selected. If Yes, the outlet is turned on and the outlet background color changes to green. If No, the user is returned to the Power Control window. If the user has not selected an outlet yet, a warning_popup opens that states: "You need to select the appropriate device(s) by clicking on the connector icon." Click on the Continue button to return to the Power Control window

2.2.7.3.3 Power Control - Reboot. To reboot the outlets, select the desired outlet(s), then click on the Reboot button. If the user has not selected an outlet yet, a warning_popup opens that states: "You need to select the appropriate device(s) by clicking on the connector icon." Click on the Continue button to return to the Power Control window.

When rebooting the RPG, it is recommended to have the HCI already selected and visible on the screen. The user can more easily tell when the RPG has finished rebooting by the information displayed on the HCI such as the State and Mode text lines and the data flow.

While the RPG is rebooting, additional windows will open temporarily. There is a Waiting window that displays a text string and XXX countdown clock stating: "Waiting for graceful shutdown of the RPG. XXX seconds remaining." A second window appears titled Waiting for Network Connectivity. Its text string will read: "Node "RPG" is not reachable. Waiting for a valid network connection. HCI will exit after 90 seconds. XX seconds remaining. XX is a countdown in seconds of the time remaining. The user does not have to take any action with these temporary windows.

NOTE

It takes approximately 2 ½ minutes for the RPG to fully reboot itself.

The RPG Reboot clears out the entire data base and brings up the RPG in a clean start. This has a more significant impact on the RPG than the Restart buttons (All Tasks or Options) found in the RPG Control window.

2.2.7.4 RPG HCI. The fourth button from the left is labeled RPG HCI. Click on this button and the HCI window opens. If the RPG is a distance from the MSCF, a Data Transfer Meter will appear for a few seconds. Then a Waiting for Network Connectivity window will appear that states: "Node "rpg" is not reachable. Waiting for a valid network connection. HCI will exit after 90 seconds. XX seconds remaining" XX is a countdown in seconds of the time remaining. Click on the Cancel button to cancel the request for the HCI and return to the MSCF.

2.2.7.5 RDA HCI. The fifth button from the left is labeled RDA HCI. This button is reserved for future software builds and is not implemented at this time.

2.2.7.6 BDDS HCI. The last button on this row is the BDDS HCI button. Click on the BDDS HCI button and the Base Data Distribution Server window opens. See [Figure 2-17](#).

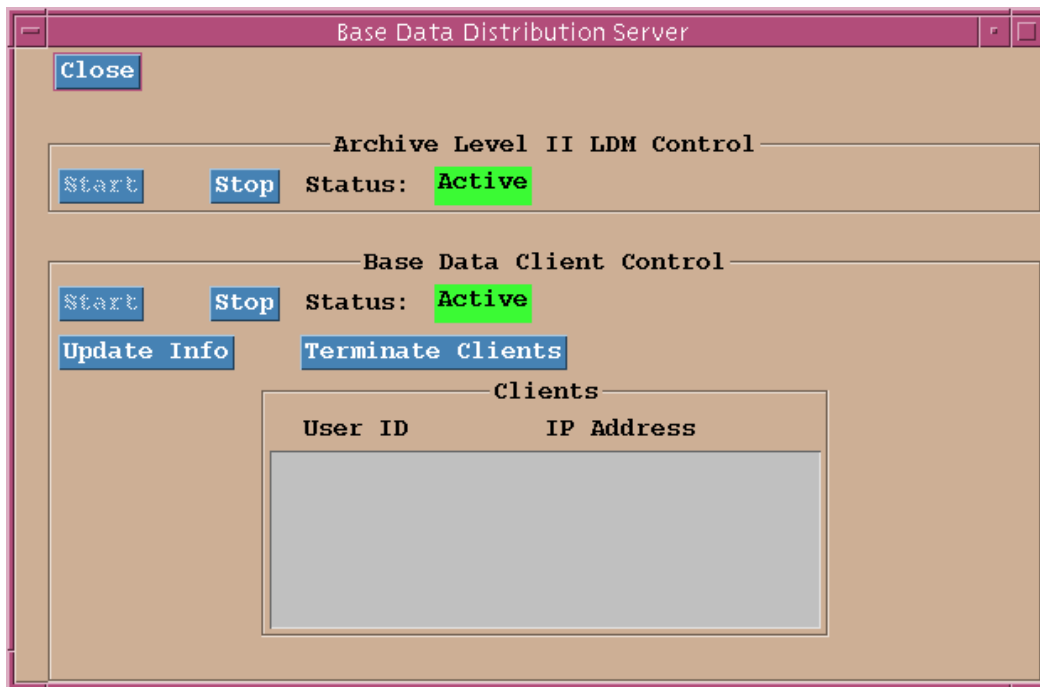


Figure 2-17. BDDS HCI

The BDDS window has two distinct areas: one for Archive II LDM Control and one for Base Data Client Control.

2.2.7.6.1 Archive Level II LDM Control. This area contains a duplication of the functions contained in the Archive II LDM Data button on the RPG Control/Status screen. See paragraph [2.6.1](#) for additional information on the functionality of this area.

2.2.7.6.2 Base Data Client Control. This area contains four control buttons for BDDS Control and one text string labeled "Status:" with two texts available: Active with a green background and Not Active with a yellow background.

2.2.7.6.2.1 Start. Click on this button to activate the BDDS. If the BDDS is already active, the Start BDDS button is grayed-out and desensitized.

2.2.7.6.2.2 Stop. Click on this button to stop the BDDS. If the BDDS is not active, the Stop BDDS button is grayed-out and desensitized. A warning_popup opens that states: "You are about to stop the BDDS server. Do you want to continue?". Click on Yes or No.

2.2.7.6.2.3 Update Info. Click on this button to manually refresh the BDDS information in the window.

2.2.7.6.2.4 Terminate Clients. If this button is clicked before selecting any clients from the display box in the lower middle portion of the window, a warning_popup opens that states: "Please select clients first." Click on the Continue button and the user is returned to the BDDS window. Move the cursor to the BDDS clients box at the bottom of the window and click on the client(s) to be terminated. The user can click and drag to select several clients in the vertical column. Once the name opens with a black background, click on the Terminate Clients button. A warning_popup opens that states: "Are you going to terminate X number of Clients, AAAA?" Click on Yes or No. X number is the total number selected; AAAA are the actual clients selected. If Yes, the clients are terminated from the listing and the user is returned to the BDDS window. If No, the clients remain active, and the user is returned to the BDDS window.

2.2.7.6.3 Assign New Clients. A BDDS client can only be added by the BDDS client itself. A BDDS window at the MSCF has no commands to add a client and the BDDS server at the RPG can not add clients on its own. The customer at the BDDS client system has to start the application software to begin receiving the data and to be listed as a client in the BDDS window.

2.2.7.7 FAA Redundant. If the radar is a FAA redundant configuration, there will be another block to the far right that is titled: Channels. Directly underneath the title are two control buttons. The left button has a "1" beside it; the right button has a "2" beside it. These numbers represent Channel 1 or Channel 2 in the FAA redundant configuration. See [Figure 2-18](#).

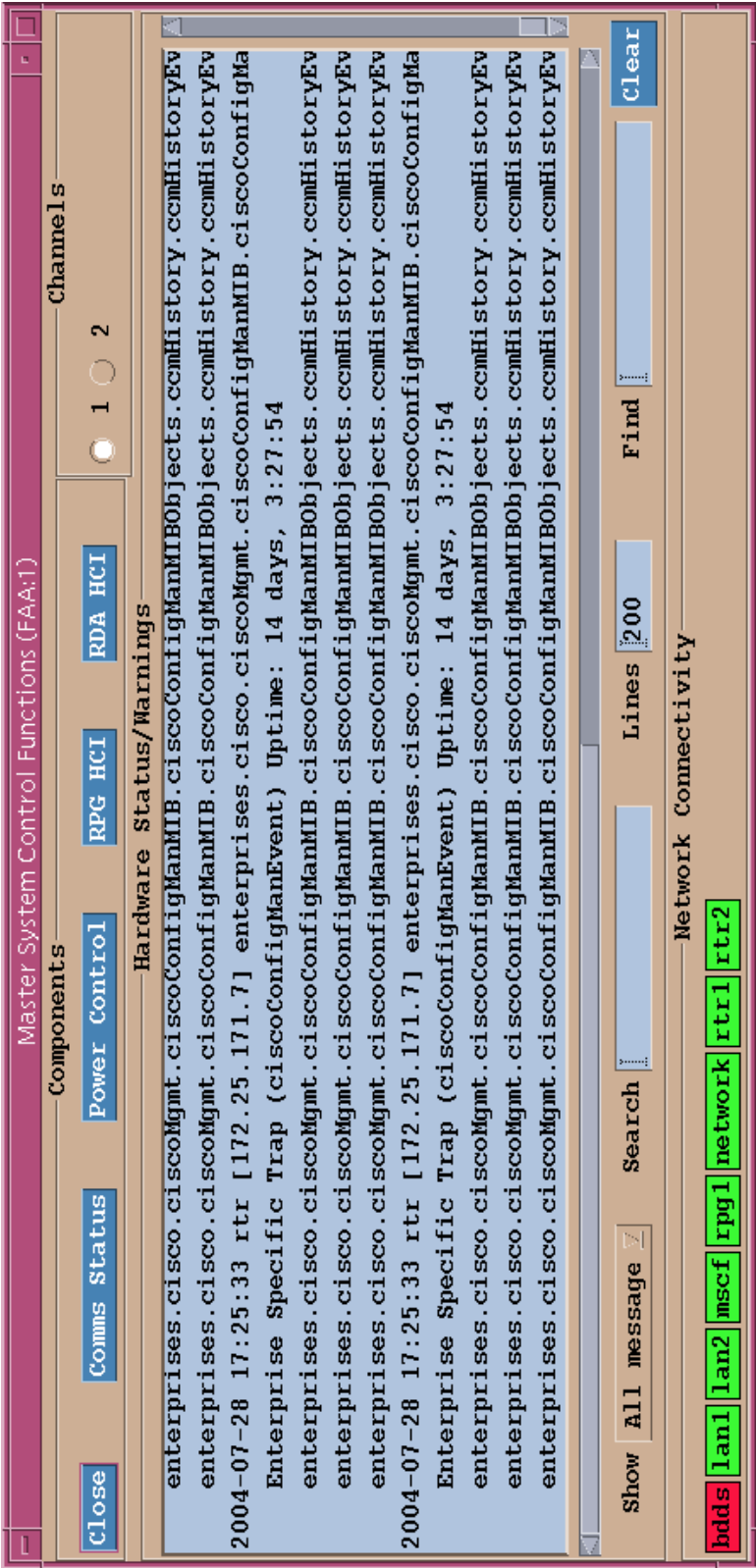


Figure 2-18. MSCF - FAA

To perform all functions for a particular channel such as selecting the RPG HCI, checking the power, or reading the Hardware Status/Warnings, the button directly to the left of that channel's number must be highlighted white. To display and interact with Channel 1, click on the button to the left of the "1." Channel 1 becomes the displayable channel. To display and interact with Channel 2, click on the button to the left of the "2". When it becomes white, then Channel 2 becomes the displayable channel. These two buttons act as toggle switches. Only one can be highlighted at a time.

The messages and warnings displayed in the middle of the MSCF are for the selected channel. It does NOT have to be the controlling channel to show the information. The Hardware Status/Warnings Section is refreshed when the other FAA channel is selected.

2.2.7.8 Hardware Status/Warnings Window. In the center of the MSCF window is a separate window that displays the Hardware Status/Warnings from Simple Network Management Protocol (SNMP) traps. This log displays all the lines from the SNMP traps. They are color coded to facilitate interpretation. When the background color is green, that represents a link up trap. When the background color is red, that represents a link down trap. When the background color is gray, that represents information only. The SNMP trap information is mostly useful for maintenance personnel. If an operator notices a lot of red background lines, that is an indication that maintenance should be notified.

2.2.7.9 Show Pull Down Menu. In the lower left hand corner of the MSCF window, just above the bottom row, is the "Show" pull down menu of the categories of status and warnings that are displayed in the middle window. Click on the down arrow and the categories that appear are: All Messages, Critical, APC, and CISCO. Click on the desired category, the middle window refreshes with the selected type of information, and that label opens in the Show block.

2.2.7.10 Search. The second item from the left on the next to the bottom row is a Search option for the Hardware Status/Warnings window. Move the cursor inside the box just to the right of the label Search and type in the character string that the user wants to search for in the Hardware Status/Warnings. The entries are case sensitive. Once the string is entered, press the Return key and the center window is refreshed with just those sections of messages containing that string. The SNMPs come in a Section of messages, so it may appear that the user received more than just the selected individual messages. If the string is identified in any portion of a section, then that entire section is displayed. To clear the Search box, click on the Clear button to the far right of this same line. To restore the status/messages to their original listing, clear out the Search box and then press the Return key.

2.2.7.11 Lines. The third item from the left on the next to the bottom row is the editable field of the number of lines that will be displayed in the Hardware Status/Warnings window. Move the cursor inside the box just to the right of the label Lines and type in the number of messages to be displayed. The maximum number of lines allowed is 1200. If a number larger than 1200 is entered, a warning_popup opens that states: "The maximum number of lines is 1200". Click on the Continue button and the user is returned to the MSCF window.

2.2.7.12 Find. The next-to-last item to the far right on the next to the bottom row is a Find option for the Hardware Status/Warnings window. Place the cursor inside the box just to the right of the label Find, type in the text string that the user wants to search for, and highlight in the Hardware Status/Warnings. The text string entries are case sensitive. Once the string is entered, press the Return key. The oldest message in the file that contains that string will now be highlighted by changing to white lettering. All the sections and messages still remain in the window. Clicking “Enter” will move you to the next occurrence of the Find string. To clear the Find option text string and remove the white background from the Find option result, click on the Clear button to the right of the Find box.

2.2.7.13 Clear Button. The Clear button is used to close both the Search and the Find option text strings. It has no other effect on the Search Option. The white line that highlighted the Find option is deleted when the Clear button is clicked.

2.2.7.14 Network Connectivity. The bottom line of the MSCF contains a series of color coded boxes that represent devices on all RPG configurations as described below. Color coding gives a quick overall status of the network devices at a glance. Devices displayed in green are currently connected and those in red are not. This area only displays status information and no commands are initiated by clicking on any of the device boxes. To take action on any of these connects or disconnects, the user must go to the Power Control window.

NWS/DoD displays at the RPG Maintenance Position Terminal have boxes labeled: bdds, lan, mscf, network, and rtr.

NWS/DoD displays at the MSCF have boxes labeled: bdds, lan, network, rpg, and rtr.

FAA displays at the RPG Maintenance Position Terminal have boxes labeled: lan, lan2, mscf, network, rpg2, rtr, and rtr2.

FAA displays at the MSCF have boxes labeled: lan, lan2, network, rpg, rpg2, rtr, and rtr2. All boxes are easily identifiable by their component label except for the new one called the network box. The network box represents the link between the RPG and the MSCF. The MSCF sends out a ping once every ten seconds to the RPG and to all other nodes in that network. If the links are intact, the network box remains green. If the links are not intact, the network box turns red.

SECTION 2.3. HUMAN COMPUTER INTERFACE (HCI)

This section describes how to use the HCI component of the RPG. Its primary purpose is to control various functions of the RPG and RDA and provide overall system status. The HCI is titled RPG Control/Status window and is referred to as either the HCI or the RPG Control/Status window. The RPG Control/Status window can be broken into four major regions: RDA Status/Control, RPG Status/Control, Users/Status, and Applications. At any given moment, the state of each of the major components can be determined by visual inspection of the display. Data flowing between components are represented by “moving boxes” along the connections. Menus and commands can be invoked by clicking (one left button click) a specific button. A button or object is identified as selectable in the RPG Control/Status window if the cursor shape changes to a pointing hand as the cursor moves over it. This is only true when the cursor is inside the RPG Control/Status window. See [Figure 2-19](#).

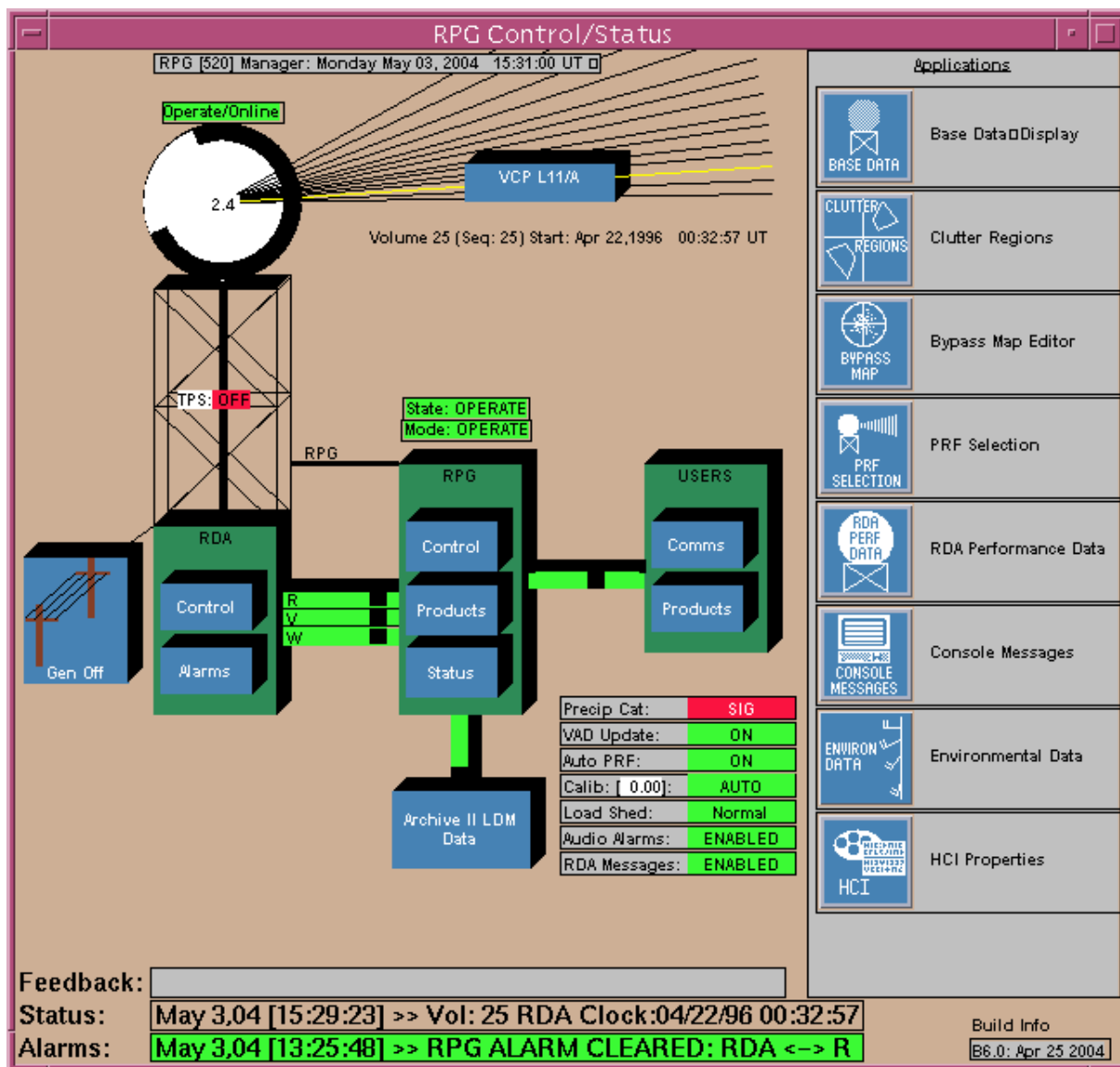


Figure 2-19. RPG Control/Status

The size of the RPG Control/Status window can be changed at any time by positioning the cursor over one of the window corners and dragging the mouse with the left mouse button pressed. Buttons and graphics are resized and repositioned accordingly. To preserve the integrity of all buttons and graphics, a minimum window size of 640x550 pixels is fixed.

2.3.1 RDA Icon and Graphical Display of RDA.

The left third of the RPG Control/Status window is devoted to RDA specific items. The display consists of the RDA icon containing a Control button and an Alarms button, and a graphical representation of the radar tower, radome, and power source. In addition, if active RDA alarms are present (as indicated by the RDA Alarm Summary in the latest RDA status message), its alarm

category appears in red directly to the left of the radome for each RDA device category identified as having an active alarm. The following RDA devices (and button mnemonic) are identified:

- Tower/Utilities (UTL)
- Antenna/Pedestal (PED)
- Transmitter (XMT)
- Receiver/Signal Processor (RSP)
- RDA Control (CTR)
- User Link (USR)
- Archive (ARC)
- Wideband (WID)

2.3.2 RDA Power Source.

The RDA power source is either utility or generator and is reported by information contained in the latest RDA status message. The utility source is represented by a pair of utility poles with a wire connecting one of the poles to the top of the RDA icon. The generator source is represented by a picture of a shelter and a fuel tank. The fuel level is displayed inside the fuel tank. If the power source is utility and the generator is on, or if the power source is generator and utility power is available, a text message is displayed beneath the power source graphic. When the RDA power source is generator, an automatic request for new RDA performance data is sent to the RDA at the beginning of each volume scan. The graphical representation of the fuel level in the fuel tank reflects the latest fuel level information provided by RDA performance data. See paragraph [2.3.10.1.8](#) for additional information.

2.3.3 Radome.

The Radome graphic is used to display the position of the antenna. When the system is in operate, the azimuthal position is displayed as a black arc drawn inside the radome. The leading edge on the arc is the current azimuth. When the leading edge of the trace meets the beginning azimuth position of that elevation scan, this completes a 360 degree trace around the outside edge of the radome. The completed circle disappears and then the whole process starts over again at the next elevation angle of operation. While the RDA is in Standby and the antenna is in the park position, the antenna's azimuth position is not displayed. The elevation angle is displayed as a text string at the center of the radome. The elevation angle is not displayed in the radome when the RDA is in standby. Above the radome, the RDA status and operability status are displayed as text (separated by a "/"). The color of the text is dependent on the RDA operability status.

The possible RDA status that can be displayed for the RDA are:

- Start-up
- Standby
- Restart
- Operate
- Playback
- Offline Operate
- Unknown

The possible RDA operability status (and color) that can be displayed for the RDA are:

- Operate (Green)
- Online (Green)
- Secondary (Green)
- Maint Reqd (Yellow)
- Cmd Shutdown (Yellow)
- Maint Mand (Orange)
- Inoperable (Red)
- Unknown (Red)

2.3.4 Tower.

The tower is used to separate the RDA control box from the radome. Its relative height and number of vertical sections does not reflect the actual height of the tower.

2.3.5 Transition Power Source (TPS).

If the site has a TPS installed and configured, a text line appears inside the tower near the middle. If the TPS status is OK, the text "OK" is displayed in green. If the TPS status is off, the text "OFF" is displayed in red.

2.3.6 Displayed Elevation Angle and Current VCP.

The lines emanating from the center of the radome to the center of the RPG Control/Status window represent the various elevation slices of the current VCP. The actual angle of the lines are scaled by a factor of 2 to provide better visual separation. When the RDA is in Operate, all the lines are black except for the current elevation slice that the radar is obtaining data in, and that line is highlighted yellow. When the RDA is in standby, all elevation lines are black. Inside the elevation angle lines is a blue box containing a text string (beginning with the string "VCP") that identifies the current VCP in use by the RDA. If a local (RDA) pattern is used, the VCP number is preceded by the letter "L". If a remote (RPG) pattern is used, the VCP number is preceded by the letter "R". The weather mode is displayed to the right of the VCP number as the letters "A" (Pre-

cipitation), "B" (Clear Air), or "M" (Maintenance). The current volume scan start time is displayed as a text string beneath the VCP graphic. Click in the VCP text string box and the VCP Control window is opened.

2.3.6.1 VCP Control Window. Click on the Current VCP box (located on the line emanating from the center of the radome) to bring up the VCP Control window. See Figure 2-20. This window contains selections to edit and change VCPs and control when they are updated.

CHANGE to RDA VCP	
Precipitation:	11 21
Clear Air:	31 32
Maintenance:	300

DOWNLOAD VCP from RPG			
Precipitation:	11	12	21 121
Clear Air:	31	32	
Maintenance:	300		

Modify VCP:	Current	Adaptation
Restart:	VCP	Elevation

Figure 2-20. VCP Control

2.3.6.1.1 Close Button. Click on the close button to return to the HCI (if no changes have been made to this window). If edits had been made and not yet saved, clicking on this button will bring up a warning_popup that states: "You made changes to the Current VCP data which were not saved. Do you want to save them?" Click on either Yes or No to select the desired response. If Yes, the changes are saved and the user returned to the HCI. If No, the changes remain in the windows and the user remains at the VCP Control window.

2.3.6.1.2 Auto PRF Function. To the right of the Close button are two buttons used to control the Auto PRF function: On and Off. Only one button can be set at a time. When the Auto PRF function is on, the On button is set and the button is green. When the Auto PRF function is off, the Off button is set and the button is red. These states match the Auto PRF status displayed in the RPG Control/Status window. When the Auto PRF function is on, the Auto PRF function determines the PRF that results in the least amount of range folding (obscuration) and, if the RDA is

not in local control, downloads an updated VCP to the RDA. This updated VCP takes effect at the start of the next volume scan.

To change the Auto PRF state click on the button which is not set. If the button or the title On is clicked, a warning_popup window appears that states: "You are about to enable the Auto PRF function. Do you want to continue?" Clicking Yes will turn the Auto PRF function on; clicking No will leave the Auto PRF function off. If the button or the title Off is clicked, a warning_popup appears that states: "You are about to disable the Auto PRF function. Do you want to Continue?". Clicking Yes will turn the Auto PRF function off; clicking No will leave the Auto PRF function on.

2.3.6.1.3 CHANGE to RDA VCP. The CHANGE to RDA VCP section in the VCP Control Window provides the user with selections to invoke a local VCP from VCP adaptation data stored at the RDA. Selections are organized by weather mode. If the RPG mode is Operate, the selections for all Maintenance VCPs (VCPs with numbers greater than 255) are desensitized. Maintenance VCPs are selectable only when the RPG is in one of the "Test" modes. Refer to paragraphs [2.3.13.1.2.5](#) and [2.3.13.1.2.6](#) on how to change RPG mode. If the text and background colors of one of the selections is the reverse of all of the others, it indicates that this VCP is currently active at the RDA. This is normally indicated by the white button indicating the VCP that is active and all others being the background color.

NOTE

Sites with a DRS Weather Systems, Inc, RDA cannot go into Test Mode and cannot use VCP Maintenance 300.

When in VCP Maintenance 300, in the RPG Control window, the Test Mode button is grayed-out and desensitized while the Operate Mode button is sensitized. In order to return the RPG to normal operations, first select the desired VCP from the VCP Control window. A warning_popup opens that states: "You are about to change to a VCP stored as adaptation data at the RDA. It will take effect at the start of the next volume scan. Do you want to continue?" Click on Yes or No. If No, the user is returned to the VCP Control window. If Yes, the newly selected VCP is invoked at the RDA at the start of the next volume scan and the user is returned to the VCP Control window. Then in the RPG Control window, click on Operate Mode. A warning_popup opens that states: "You are about to change to Operate mode. Do you want to continue?" Click on Yes or No. If No, the user is returned to the RPG Control window. If Yes, the RPG goes into Operate mode and the user is returned to the RPG Control window.

When the Auto PRF is ON and the operator clicks on and accepts a CHANGE to RDA VCP, that change will take place at the next volume scan, and the active (white) block will automatically switch down to the next section, the DOWNLOAD VCP from RPG. If the Auto PRF is OFF, the active (white) block will remain in the CHANGE to RDA VCP regardless of the number of volume scans that are processed.

2.3.6.1.4 DOWNLOAD VCP from RPG. The DOWNLOAD VCP from RPG section in the VCP Control window provides the user with selections to invoke a remote VCP from VCP adaptation data stored at the RPG. Selections are organized by weather mode. If the RPG mode is

Operate, the selections for all Maintenance VCPs (VCPs with numbers greater than 255) are desensitized. Maintenance VCPs are selectable only when the RPG is in one of the "Test" modes. Refer to paragraph [2.3.13.1.2.5](#), on how to change RPG mode. If the text and background colors of one of the selections is the reverse of all of the others, it indicates that this VCP is currently active at the RDA. This is normally indicated by the white button indicating the VCP that is active and all others being the background color.

NOTE

Sites with a DRS Weather Systems, Inc, RDA cannot go into Test Mode and cannot use VCP Maintenance 300.

To request change to a remote VCP, click one of the non-active buttons. A warning_popup window appears that states: "You are about to change to a VCP stored as adaptation data at the RPG. It will take effect at the start of the next volume scan. Do you want to continue?". Click the Yes button to proceed or click the No button to cancel the request. In either case, the user will return to the VCP Control window.

2.3.6.1.5 Modify VCP. The third block, Modify VCP, has two options for the user to select: Current or Adaptation. Clicking on Current brings up the PRF Selection (Modify Current VCP) window. See [Figure 2-21](#). Clicking on Adaptation brings up the Modify VCP Adaptation Data window. Both of these are discussed in detail below.

NOTE

If the RDA-RPG link is not connected or if the RDA is in local control, this window will not open. A warning_popup appears that states: "PRF selection is not allowed while the RDA is in local control or the RDA-RPG link is not connected." Click on the OK button to continue.

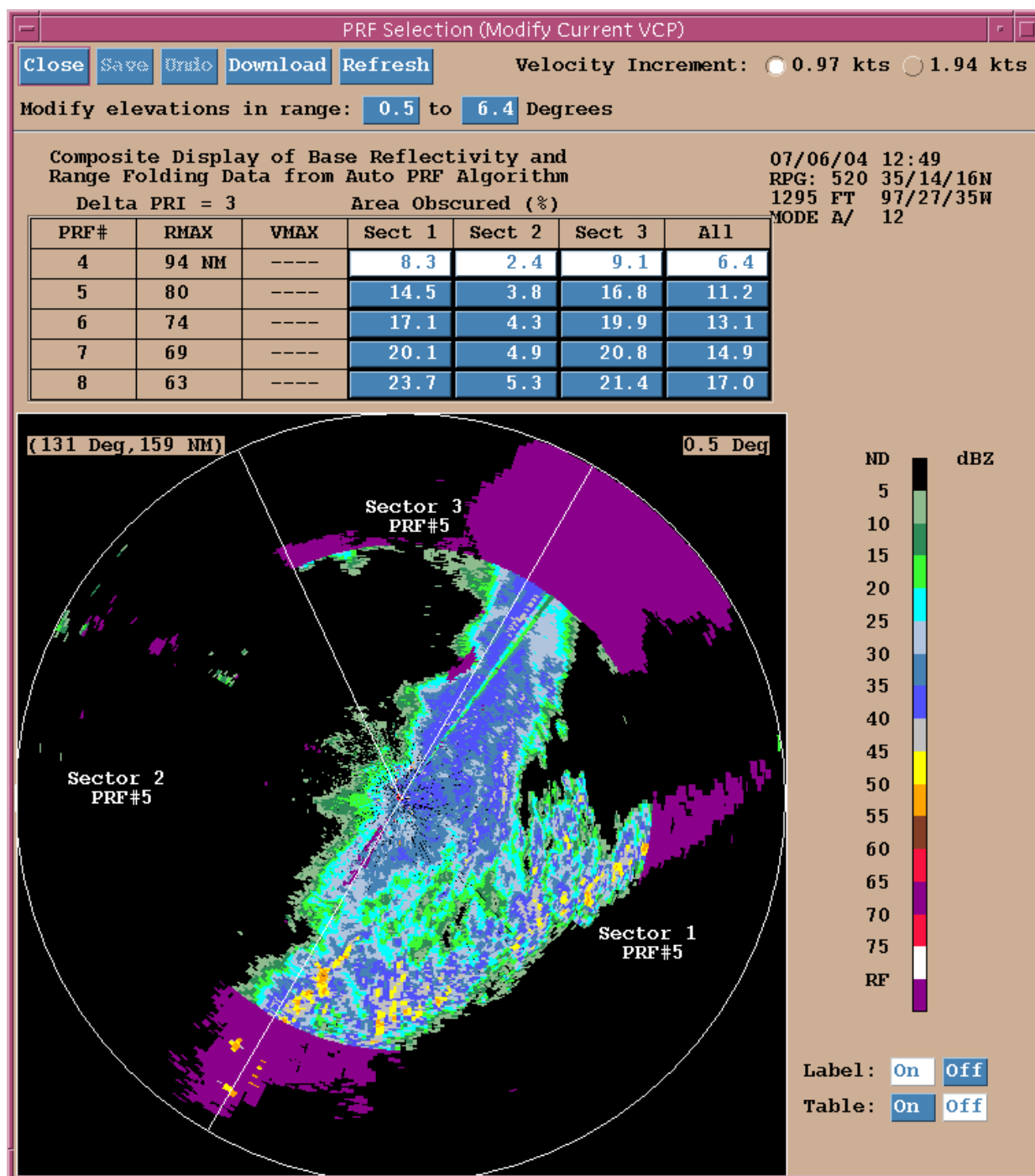


Figure 2-21. PRF Selection (Modify Current VCP)

2.3.6.1.5.1 PRF Selection (Modify Current VCP) Window. This window provides selections to modify current VCP data and download the data to the RDA. It provides a tabular and graphical display of range folding (obscuration) information calculated by the Auto PRF function so the user can determine the best PRF to use for a given sector in order to minimize the amount of obscuration for a meteorological target. The PRF Selection (Modify Current VCP) window consists of three main sections: Control, obscuration table, and graphical display.

2.3.6.1.5.1.1 Control Section. The control section contains a set of buttons to save and undo edits, download the current VCP adaptation data to the RDA, refresh the base reflectivity and obscuration data displayed in the obscuration table and graphical display region, set the velocity increment, and define the range of elevations affected by selecting items in the obscuration table and graphical display region.

2.3.6.1.5.1.1.1 Close Button. Clicking the Close button closes the PRF Selection (Modify Current VCP) Window. If any unsaved edits are detected, a warning_popup window appears that states: "You made changes to the current VCP data which were not saved. Do you want to save them?". Click on Yes to save the edits before closing the window. Click on No to close the window and discard the edits. If the Modify Current VCP Data window is open, it is also closed.

2.3.6.1.5.1.1.2 Save Button. Click the Save button to copy the edited current VCP adaptation data to file. When selected, a warning_popup window appears that states: "You are about to overwrite the current VCP data with your edits. Do you want to continue?". Click Yes to save the edits. Click No to do nothing and leave all local edits intact. The Save button is sensitized only when unsaved edits are detected.

2.3.6.1.5.1.1.3 Undo Button. Click the Undo button to discard all unsaved edits. Data displayed in the PRF Selection (Modify Current VCP), and the Modify Current VCP Data windows are refreshed. The Undo button is sensitized only when edits are detected, otherwise it is desensitized.

2.3.6.1.5.1.1.4 Download Button. Click on the Download button to request that the contents of the current VCP adaptation data file be downloaded to the RDA and used at the start of the next volume scan. When clicked, a warning_popup window appears that states: "You are about to download the current VCP changes to the RDA. Do you want to continue?". Clicking Yes will continue with the download procedure. Clicking No will do nothing and leave all local edits intact. If Yes is clicked and any unsaved edits are identified, a warning_popup window is displayed which states: "Do you want to save your changes to the current VCP before downloading?". Clicking Yes will save the edits and continue the download procedure. Clicking No will continue the download procedure without saving edits. All local edits will remain intact. If the Auto PRF function is enabled, a warning_popup appears that states: "The Auto PRF function is currently enabled. If you do not disable it, your changes may be lost at the next volume scan. Do you want to disable the Auto PRF function?". Clicking Yes will disable the Auto PRF function before proceeding with the download. Clicking No will leave the Auto PRF function enabled and proceed with the download.

2.3.6.1.5.1.1.5 Refresh Button. Click on the Refresh button to cause the obscuration and base reflectivity products used in the obscuration table and graphical display regions to be updated (latest times available). New base reflectivity and obscuration products are available in the RPG products data base after the 0.5 degree Doppler cut has completed. The data in the obscuration table and graphical display regions are not automatically updated when the new products are available.

2.3.6.1.5.1.1.6 Velocity Increment Buttons. The buttons to the right of the "Velocity Increment" label control which velocity resolution is used in the current VCP. Two velocity resolutions are available: 0.97 kts (0.5 m/s) and 1.94 kts (1.0 m/s). The button corresponding to the currently active velocity resolution is set with a white button (routinely). To change the velocity resolution, click on the button (or the corresponding title) that is not sensitized. The two act as a toggle switch between the two values.

2.3.6.1.5.1.1.7 Modify Elevation Range Buttons. The two buttons to the right of the label Modify elevations in range are used to control the range of elevations affected by changing PRF numbers and sector boundaries in the obscuration and graphical display regions. The elevation angle defined by the first button is always less than or equal to the elevation angle defined by the second button. Clicking one of the buttons advances the elevation angle to the next one defined in the current VCP. If the first button is clicked and the new elevation angle is greater than the second elevation angle, the second elevation angle is advanced. If the elevation angles defined by both buttons are equal and also the last elevation cut in the current VCP, clicking either button will reset the elevation angles defined for both buttons to the first elevation cut in the current VCP.

2.3.6.1.5.1.2 Obscuration Table Section. The obscuration table section consists of a table of labels and buttons. The size of the table is dependent on the number of PRFs which are allowed for the current VCP. A row is defined for each allowable PRF. The first table column consists of the PRF number label. The second table column contains a label defining the unambiguous range (in nautical miles) for the corresponding PRF number. The third table column contains a label defining the maximum velocity (in knots) for the corresponding PRF number. The fourth through sixth columns contain buttons with labels defining the amount of obscuration, as determined by the Auto PRF algorithm for the most recent volume scan, in each of the three sectors for the corresponding PRF number. The last column contains a button with a label defining the total amount of obscuration for all sectors. A single button in each sector column is displayed in reversed colors from the other buttons identifying the PRF number with the least amount of obscuration. Normally white represents the least amount of obscuration.

Wait until the third elevation slice of the VCP to issue this command and click Yes. Otherwise it can get ignored by the RDA and the current VCP continues on without an interruption.

Clicking a button in one of the sector columns changes the PRF number for the range of elevation cuts defined by the Modify Elevation Range Buttons to the corresponding PRF number in the table. Clicking a button in the last (All) column changes the PRF number for all sectors in the elevation range. In each case, the data displayed in the graphical display region are updated.

2.3.6.1.5.1.3 Graphical Display Section. The graphical display section contains a composite display of a base reflectivity product and corresponding obscuration data, indicating areas where velocities cannot be resolved for the specified PRF number. PRF Sector boundaries are overlain along with labels defining the sector number and current sector PRF number for each sector. In the upper left corner is a label defining the azimuth/range position of the cursor when it is inside the graphical display region. In the upper right corner is the label "0.5" indicating the data displayed corresponds to the 0.5 degree elevation cut.

When the cursor is inside the circle defining the maximum range of the product, the function of the mouse buttons change. If the position of the cursor is within two (2) degrees of a sector boundary, the cursor changes to a pointing hand indicating that pressing the left mouse button and dragging it will move the sector boundary. Releasing the left mouse button will terminate the sector boundary move. At this time, data displayed in the obscuration table and graphical display will be updated. If the cursor is more than two (2) degrees from a sector boundary and inside the circle, selecting the left mouse button will increment the PRF number and force an update to the data displayed in the obscuration table and graphical display. If the left mouse button is pressed when the maximum allowable PRF number is defined, the PRF number changes to the minimum allowable PRF number. Pressing the right mouse button has the opposite effect. The PRF number is decremented instead of incremented. If the right mouse button is pressed when the minimum allowable PRF is defined, the PRF number changes to the maximum allowable PRF.

When the user drags sector boundaries across another sector boundary, the sector numbers change to preserve clockwise ordering. However, the PRF number associated with the sector doesn't change so the new sector gets assigned the value that was previously assigned for that sector number. The PRF number should be re-mapped as well as the sector number.

In some cases, the sector number and sector PRF number label overlays will obscure important data. In these cases, the user can click the Off button to the right of the Label title. Sector number and sector PRF number labels will be turned off. To turn them back on, select the On button to the right of the Label title. The currently active label mode is identified by the button with the reversed foreground and background colors. This will normally be white.

A tabular view of the current VCP adaptation data can be presented by clicking the On button to the right of the Table title. Clicking the On button brings up the Modify Current VCP Data window. See [Figure 2-22](#). Clicking the Off button closes the Modify Current VCP Data window. The currently active table mode is identified by the button with the reversed foreground and background colors (normally the white color is active).

Modify Current VCP Data

Show: ☐ PRF# ☐ RMAX (NM) ☐ Velocity Increment: ☐ 0.97 kts ☐ 1.94 kts

Elevation		Scan		Waveform		Sector 1		Sector 2		Sector 3		Signal/Noise Ratio (dB)		
#	Degrees	Seconds	Type	Azimuth	PRF #	Azimuth	PRF #	Azimuth	PRF #	Azimuth	PRF #	Refl	Vel	Width
1	0.5	19	CS	0.0	1	0.0	1	0.0	1	0.0	1	2.00	2.00	2.00
2	0.5	19	CD/W	30.0	5	210.0	5	335.0	5	335.0	5	3.50	3.50	3.50
3	1.5	18	CS	0.0	1	0.0	1	0.0	1	0.0	1	2.00	2.00	2.00
4	1.5	19	CD/W	30.0	5	210.0	5	335.0	5	335.0	5	3.50	3.50	3.50
5	2.4	22	B	30.0	5	210.0	5	335.0	5	335.0	5	3.50	3.50	3.50
6	3.4	20	B	30.0	5	210.0	5	335.0	5	335.0	5	3.50	3.50	3.50
7	4.3	20	B	30.0	5	210.0	5	335.0	5	335.0	5	3.50	3.50	3.50
8	5.3	21	B	30.0	5	210.0	5	335.0	5	335.0	5	3.50	3.50	3.50
9	6.2	21	B	30.0	5	210.0	5	335.0	5	335.0	5	3.50	3.50	3.50
10	7.5	14	CD/WO	30.0	6	210.0	6	335.0	6	335.0	6	3.50	3.50	3.50
11	8.7	14	CD/WO	30.0	7	210.0	7	335.0	7	335.0	7	3.50	3.50	3.50
12	10.0	14	CD/WO	30.0	7	210.0	7	335.0	7	335.0	7	3.50	3.50	3.50
13	12.0	14	CD/WO	30.0	7	210.0	7	335.0	7	335.0	7	3.50	3.50	3.50
14	14.0	14	CD/WO	30.0	7	210.0	7	335.0	7	335.0	7	3.50	3.50	3.50
15	16.7	14	CD/WO	30.0	7	210.0	7	335.0	7	335.0	7	3.50	3.50	3.50
16	19.5	14	CD/WO	30.0	7	210.0	7	335.0	7	335.0	7	3.50	3.50	3.50

Azimuth Range: (0 to 359.9) - SNR Range: (-12.0 to 20.0 dB)

Figure 2-22. Modify Current VCP Data

2.3.6.1.5.1.4 Modify Current VCP Data Window. The Modify Current VCP Data window presents a tabular view of the current VCP adaptation data. It provides a means to view and edit individual data elements. In addition to editing sector boundary, PRF number, and velocity increment definitions, signal to noise ratios can be edited.

2.3.6.1.5.1.4.1 Close Button. Clicking the Close button closes the Modify Current VCP Data window. Since the PRF Selection (Modify Current VCP) Window is left open, no warning_popup window appears if any unsaved edits are detected.

2.3.6.1.5.1.4.2 Undo Button. Clicking the Undo button discards all unsaved edits. Data displayed in the PRF Selection (Modify Current VCP) and Modify Current VCP Data windows are refreshed. The Undo button is sensitized only when edits are detected, otherwise it is grayed-out and desensitized.

2.3.6.1.5.1.4.3 Show Buttons. To the right of the "Show" label are two buttons: PRF# and RMAX (NM). These buttons allow the user to view either PRF number or unambiguous range in the table sector definitions. The button corresponding to the currently active mode is set and is normally displayed in white.

2.3.6.1.5.1.4.4 Velocity Increment Buttons. The buttons to the right of the Velocity Increment label control which velocity resolution is used in the current VCP. Two velocity resolutions are available: 0.97 kts (0.5 m/s) and 1.94 kts (1.0 m/s). The button corresponding to the currently active velocity resolution is set and normally displayed in white.

2.3.6.1.5.1.4.5 Current VCP Table. The current VCP adaptation data table contains an entry for each cut number defined in the current VCP. The cut number and corresponding elevation angle are presented in the first two columns. These values are not editable. The scan rate and waveform type are presented in the next two columns. The waveform types are represented by mnemonics which are defined in Table 2-1 below:

Table 2-1. Waveform Types

Mnemonic	Description
CS	Contiguous Surveillance
CD	Contiguous Doppler
CD/W	Contiguous Doppler with Ambiguity Resolution
CD/WO	Contiguous Doppler without Ambiguity resolution
B	Batch
SPP	Staggered Pulse Pair

These values are also not editable.

Following the waveform column are three pairs of columns for editing the sector azimuth boundary and PRF number for the three sectors. The sector azimuth boundary represents the end boundary, in the clockwise direction for the sector and the beginning boundary of the next sector. The sector 3 azimuth boundary represents the beginning boundary for sector 1. The azimuth angles must be in the range 0.0 to 360.0 degrees. Entering a value outside this range will result in a warning_popup window appearing that states: "You entered an invalid value of X.X. The valid range is 0.0 to 359.9", where X.X is the value input by the user. Click on the Continue button to return to the field that is being edited. The sector azimuth boundary and PRF number cannot be edited for contiguous surveillance waveform type cuts.

The PRF number for a given sector and cut can be changed by clicking the associated button. The PRF number (and button label) will change to the next allowable PRF for the VCP. If the maximum allowable PRF is defined and the button is selected, the PRF number changes to the minimum allowable PRF number for the VCP.

If the "RMAX (NM)" button is set (or white), then the unambiguous range is displayed for the PRF number button label instead of the PRF number. Internally, the unambiguous range is always mapped to a PRF number.

Following the sector definition columns are the signal to noise ratio columns. Signal to noise ratios are defined for each of the three moments. For contiguous surveillance waveform type cuts, only the reflectivity signal to noise ratio can be edited. For contiguous Doppler with ambiguity resolution waveform type cuts, only the velocity and spectrum width signal to noise ratios can be edited. Input signal to noise ratios must be in the range -12 dB to 20 dB. Entering a value outside this range will result in a warning_popup appearing that states: "You entered an invalid value of X.XX. The valid range is -12.00 to 20.00", where X.XX is the value input by the user. Click on the Continue button to return to the field that is being edited.

If the user changes PRF number or sector azimuth angles in the table, the changes are reflective in the graphical display, no matter which cut was changed in the table. The design of the task intended that only changes to the 0.5 degree cut in the table would be reflected in the graphical display. In an operational environment, it is recommended that the PRF number and sector boundaries will be changed via the graphical display, not the table, since the user can visually see what the changes will do. The table should be used if Signal/Noise Ratio (SNR) values need to be changed.

If any unsaved changes were made on this PRF Selection window and the user clicks on the Close button in the upper left hand corner, a warning_popup appears that states: "You made changes to the current VCP data which were not saved. Do you want to save them?" Click on either Yes or No to select the desired response.

2.3.6.1.5.2 Modify VCP Adaptation Data Window. Click on the Adaptation button in the VCP Control window and the Modify VCP Adaptation Data window opens ([Figure 2-23](#)). The Modify VCP Adaptation Data window provides selections to modify any of the VCP adaptation data files stored at the RPG. The window is password protected.

Close Save Undo
Baseline: Restore Update
ACC

Modify VCP Adaptation Data

☐ 11 ☐ 12 ☐ 21 ☐ 31 ☐ 32 ☒ 121 ☐ 300

VCP Selection

Show: ☐ PRF# ☐ RMAX (NM) Velocity Increment: ☐ 0.97 kts ☐ 1.94 kts

Elevation		Scan		Waveform		Sector 1		Sector 2		Sector 3		Signal/Noise Ratio (dB)	
#	Degrees	Seconds	Type	Azimuth	PRF #	Azimuth	PRF #	Azimuth	PRF #	Ref1	Vel	Ref1	Width
1	0.5	12	CS	0	8	0	8	0	8	2.00	2.00	2.00	2.00
2	0.5	12	CD/W	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	3.50
3	0.5	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	3.50
4	0.5	17	CD/WO	30.0	4	210.0	4	335.0	4	3.50	3.50	3.50	3.50
5	1.5	12	CS	0	8	0	8	0	8	2.00	2.00	2.00	2.00
6	1.5	12	CD/W	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	3.50
7	1.5	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	3.50
8	1.5	17	CD/WO	30.0	4	210.0	4	335.0	4	3.50	3.50	3.50	3.50
9	2.4	19	B	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	3.50
10	2.4	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	3.50
11	2.4	17	CD/WO	30.0	4	210.0	4	335.0	4	3.50	3.50	3.50	3.50
12	3.3	17	B	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	3.50
13	3.3	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	3.50

Azimuth Range: (0 to 359.9 Deg)
SNR Range: (-12.0 to 20.0 dB)

Figure 2-23. Modify VCP Adaptation Data

The top line has five buttons and the padlock for the password protected entries. The first button, Close, closes the window and returns the user to the VCP Control window. The other four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially grayed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized. If any unsaved edits are detected, a warning_popup appears that states: "Do you want to save the changes you made to the currently selected VCP?" Click Yes to save the edits before closing the window. Click No to close the window and discard the edits.

In the "VCP Selection" box are a set of buttons for selecting the VCP for display and edit. A button is defined for all VCPs defined in the VCP adaptation data file. By default, the VCP which matches the currently active VCP is selected. In order to just display the desired data, the padlock (password protection) does not have to be opened. However, if the user wants to edit any VCP, (paragraph 2.3.6.1.5.2) selections, a warning_popup appears that states: "Do you want to save the changes you made to the currently selected VCP?". Click Yes to write all edits to the previously active VCP to the working file before changing to the new VCP. Click No to discard unsaved edits to the previously selected VCP. The state of the Velocity Increment buttons and VCP table will be updated with data for the newly selected VCP.

To the right of the Show label are two buttons: PRF# and RMAX (NM). These buttons allow the user to view either PRF number or unambiguous range in the table sector definitions. The button corresponding to the currently active mode is set and is usually displayed in white.

The buttons to the right of the Velocity Increment label control which velocity resolution is used in the current VCP. Two velocity resolutions are available: 0.97 kts (0.5 m/s) and 1.94 kts (1.0 m/s). The button corresponding to the currently active velocity resolution is set and is usually displayed in white.

To open the password protected fields for edit, follow the procedures described in paragraph 2.2.4.1.7.

Once a password has been accepted, a user can now edit the window. The selected VCP adaptation data table contains an entry for each cut number defined in the selected VCP. The cut number and corresponding elevation angle are presented in the first two columns. These values are not editable. The scan rate and waveform type are presented in the next two columns. The waveform types are represented by mnemonics which are defined in Table 2-2 below:

Table 2-2. Waveform Types

Mnemonic	Description
CS	Contiguous Surveillance
CD	Contiguous Doppler

Table 2-2. Waveform Types (Continued)

Mnemonic	Description
CD/W	Contiguous Doppler with Ambiguity Resolution
CD/WO	Contiguous Doppler without Ambiguity resolution
B	Batch
SPP	Staggered Pulse Pair

These values are also not editable.

Following the waveform column are three pairs of columns for editing the sector azimuth boundary and PRF number for the three sectors. The sector azimuth boundary represents the end boundary, in the clockwise direction for the sector and the beginning boundary of the next sector. The sector 3 azimuth boundary represents the beginning boundary for sector 1. The azimuth angles must be in the range 0.0 to 359.9 degrees. Entering a value outside this range will result in a warning_popup window appearing that states: "You entered an invalid value of X.X. The valid range is 0.0 to 359.9", where X.X is the value input by the user. Click on the Continue button to return to the field that is being edited. The sector azimuth boundary and PRF number cannot be edited for contiguous surveillance waveform type cuts.

The PRF number for a given sector and cut can be changed by clicking the associated button. The PRF number (and button label) will change to the next allowable PRF for the VCP. If the maximum allowable PRF is defined and the button is selected, the PRF number changes to the minimum allowable PRF number for the VCP.

If the "RMAX (NM)" button is set (or white), then the unambiguous range is displayed for the PRF number button label instead of the PRF number. Internally, the unambiguous range is always mapped to a PRF number.

Following the sector definition columns are the signal to noise ratio columns. Signal to noise ratios are defined for each of the three moments. For contiguous surveillance waveform type cuts, only the reflectivity signal to noise ratio can be edited. For contiguous Doppler with ambiguity resolution waveform type cuts, only the velocity and spectrum width signal to noise ratios can be edited. Input signal to noise ratios must be in the range -12 dB to 20 dB. Entering a value outside this range will result in a warning_popup appearing that states: "You entered an invalid value of X.XX. The valid range is -12.00 to 20.00", where X.XX is the value input by the user. Click on the Continue button to return to the field that is being edited.

Once the changes have been made and are within the allowable ranges, then the Save and Undo buttons are sensitized. The Close button will close the window. If the changes have not yet been saved, a warning_popup opens that states: "Do you want to save the changes you made to the currently selected VCP?" Click on either the Yes or No button to select the desired response. The Save button saves the changes but first brings up a warning_popup that states: "Do you want to save the changes you made to the currently selected VCP? Click on either the Yes or No button to

select the desired response. If Yes is selected, the changes are saved, the Save and Undo buttons grayed-out and desensitized, and the user returned back to the Modify VCP Adaptation Data window. If No is selected, the changes are not saved but remain in the window, and the Save and Undo buttons are still active. The Undo button undoes all the changes without any warning_popup window and desensitizes the Save and Undo buttons.

The Baseline: Restore and Baseline: Update buttons are sensitized and available to the operator either after the password has been entered or the Save/Undo buttons have been utilized. Click on the Restore button to replace the working copy of VCP adaptation data with the backup copy. A warning_popup appears that states: "You are about to restore ALL VCP adaptation data to baseline values. Do you want to continue?" Click Yes to replace the working copy with the backup copy and update data displayed in the Modify VCP Adaptation Data window. Click No to do nothing but return to the same window. Click on the Update button to replace the backup copy of VCP adaptation data with the working copy. A warning_popup appears that states: "You are about to replace the baseline VCP adaptation data values. Do you want to continue?" Click Yes to replace the backup copy with the working copy. Click No to do nothing but return to the same window.

2.3.6.1.6 Restart VCP. Clicking the VCP button to the right of the Restart label brings up a warning_popup that states: "You are about to stop the current data collection and start over at the lowest elevation cut. Do you want to continue?" Click Yes to cause a volume scan restart command to be sent to the RDA. The message "Requesting the VCP to be restarted" is displayed in the feedback line of the RPG Control/Status window. The message "Command RDA to Restart Volume Scan" is written to the system status log. Click No and the user is returned to the VCP Control window with no other action taken.

Wait until the third elevation slice of the VCP to issue this command and click Yes. Otherwise it can get ignored by the RDA and the current VCP continues on without an interruption.

2.3.6.1.7 Restart Elevation. Clicking the Elevation button to the right of the Restart label brings up a warning_popup that states: "You are about to stop the current data collection and start the elevation cut over. Do you want to continue?". Click Yes to cause an elevation restart command to be sent to the RDA. The message "Requesting the elevation cut to be restarted" is displayed in the feedback line of the RPG Control/Status window. The message "Commanding RDA to Restart RDA Elevation Cut x", where "x" is the current elevation cut number, is written to the system status log. Click No and the user is returned to the VCP Control window with no other action taken.

2.3.7 RDA Alarm Summary.

If any of the eight RDA components has an active alarm (as indicated in the latest RDA status message), red buttons with labels corresponding to the RDA components with active alarms are displayed to the left of the radome. Each label is defined by a mnemonic for each of the eight RDA components. These are:

ARC - Archive
CTR - RDA Control

PED - Antenna/Pedestal
 RSP - Receiver/Signal Processor
 USR - User Link
 UTL - Tower/Utilities
 WID - Wideband
 XMT - Transmitter

Each of the buttons are clickable (cursor shape changes to a pointing hand when it is moved over any of the buttons). Clicking a button opens the RDA Alarms window (if it isn't already) and sets the device filter to the RDA component corresponding to the button. Only alarms for that component are displayed. A detailed description of the RDA Alarms window can be found in paragraph [2.3.10.2](#).

2.3.8 MLOS Control Window.

For sites which are configured for Microwave Line-Of-Site (MLOS) connectivity, a window containing the label "MLOS" is displayed to the right of the tower. Click on the "MLOS" button (the cursor changes to a pointing hand when it is moved over the box) to open the MLOS Status window ([Figure 2-24](#)).

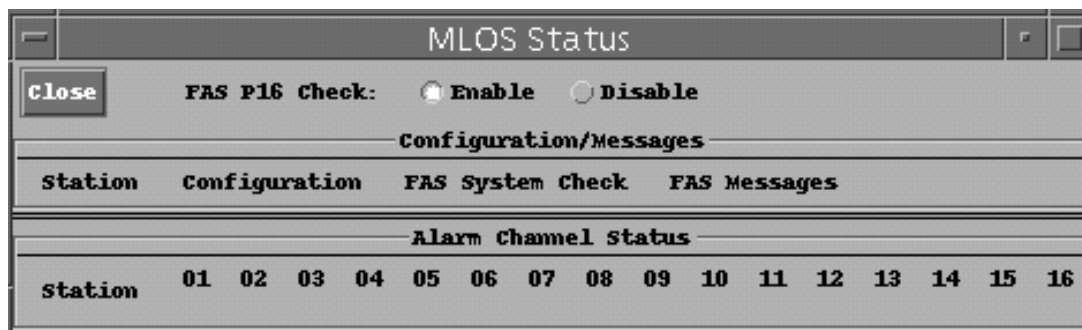


Figure 2-24. MLOS Status

2.3.8.1 MLOS Status Window. The MLOS Status window is divided into three sections: Control, Configuration/Messages, and Alarm Channel Status. The Control section contains buttons to close the window and to control the handling of Fault Alarm System (FAS) channel 16 messages. In the upper left hand corner is a Close button. Click on this Close button to close the MLOS Status window and return to the HCI.

2.3.8.1.1 FAS P16 Check Buttons. The buttons to the right of the "FAS P16 Check" label are used to control message handling by the RPG. The FAS P16 checks are currently not implemented.

2.3.8.1.2 Configuration/Messages Section. Beneath the Configuration/Messages label is a table containing information on station configuration and status. Each configured station is represented

by a row in the table. The first table column contains the station ID. The second table column contains the station configuration. The possible configurations are:

- RPG NON DIV
- RPG DIV
- RDA NON DIV
- RDA DIV
- RPT NON DIV
- RPT DIV
- RPT ND/DIV

The third table column contains a label indicating the station FAS System Check state. If the message is an alarm, it has a red background. If a message is about functional items, like a reset, it has a green background. All other messages have a tan background. The list of FAS messages and corresponding FAS system check states are:

- FAIL Database Verified
- NORMAL Power Fail Reset
- FAIL Station Failure COS
- NORMAL Communications Restored

2.3.8.1.3 Alarm Channel Status Section. Beneath the "Alarm Channel Status" label is a table containing channel alarm information for each station. A station entry is represented by a row of colored boxes representing the alarm state of channels 1-16. A box is green and unlabeled if the corresponding channel state is normal. A box is red and contains the letter A if the corresponding channel is in an alarm state (active alarm). The alarm meaning for channels 01-06 are dependent on the MLOS station configuration and include "summed" alarms. The alarm meaning for channels 07-16 are as follows:

- 07 - Unauthorized Entry
- 08 - Utility Power
- 09 - Generator Power
- 10 - Converter Output Voltage
- 11 - Battery Voltage
- 12 - Transfer Switch in Utility Position
- 13 - Low Fuel Level
- 14 - Transfer Switch Not in Automatic
- 15 - Aircraft Warning Light Failure
- 16 - Flashes at a 30 cycle/second rate to exercise the system

See the "Interface Control Document for the MLOS Fault Alarm System" for more information on MLOS alarms.

2.3.9 RDA Control Indicator.

Between the tower icon and RPG icon is a connecting line. If the RDA-RPG wideband link is connected there is a label displayed just above the line indicating who has control of the RDA. If the label status is RDA, the RDA is in local control and will not accept RDA control commands from the RPG. Non-controlling functions such as requesting status and bypass maps are allowed when the RDA has control. If the label status is RPG, the RPG has remote control of the RDA and RDA control commands are accepted by the RDA from the RPG. If the label status is EITHER, the RDA can be controlled by either the RDA or RPG. No label (or line) gets displayed when the RDA-RPG wideband link is not connected.

2.3.10 RDA Icon.

Beneath the tower icon is an icon/box containing the label RDA and two buttons labeled Control and Alarms (Figure 2-25). Click on the Control and Alarms buttons when the cursor changes to a pointing hand as it is moved over them to bring up additional windows. If there is an RDA INOP alarm, the RDA box will turn from green to red.

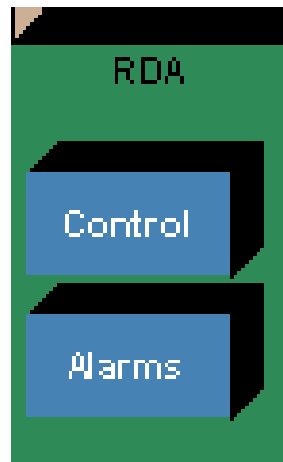


Figure 2-25. RDA Icon

2.3.10.1 RDA Control/Status Window. Click on the Control button in the RDA icon to open the RDA Control/Status window. This window shows the current state of the RDA. See Figure 2-26. If RDA control has been given to the RPG, the operator can use this window to change the state of the RDA. The top line of the window will be described first, followed by the five major boxes in the middle of the window, and finally the six additional informational categories at the bottom of the window.

RDA Control/Status			
Close	Get Status	RDA Alarms	Moments VCP
RDA State State: Operate <input type="radio"/> Standby <input type="radio"/> Restart <input type="radio"/> Operate		RDA Control Control: Remote (RPG) <input type="radio"/> Enable Local (RDA) <input type="radio"/> Select Remote (RPG)	
RDA Power Source Source: Utility <input type="radio"/> Utility <input type="radio"/> Auxiliary		Interference Suppr. Status: Enabled <input type="radio"/> Enabled <input type="radio"/> Disabled	
		Calibration Status: Automatic <input type="radio"/> Automatic <input type="radio"/> Manual	
Operational Mode: Operational		Calib. Correction: 0.00 dB	
Control Authority: No Action		Interference Rate: 0/sec	
Transmitter Power: 15000 Watts		Moments Enabled: RVW	

Figure 2-26. RDA Control/Status

For FAA Redundant configurations, there is an additional box to the right of the RDA Control box. This box is called Redundant Control and has two formats; one for FAA Channel 1 and the other for FAA Channel 2. This area is used to switch channels. Redundant configurations are described in more detail in paragraph [2.7.3](#).

2.3.10.1.1 Close Button. Click on the Close button in the upper left hand corner to close the RDA Control/Status window and return to the HCI.

2.3.10.1.2 Get Status Button. This button requests the latest RDA status information from the RDA. The new information will be reflected at the bottom of the RDA Control/Status window. The RDA status information is routinely updated once per volume scan. This button provides the opportunity to update the routine input. The message "Requesting RDA Status data" is displayed in the feedback line of the RPG Control/Status window. When a new RDA status message is received by the RPG, the message "Requested RDA Status Data is Available" is written to the system log file and displayed in the status line of the RPG Control/Status window. If the wideband is disconnected, the Get Status button becomes grayed-out and the functionality is desensitized. That is, clicking on it will not update the status information because new data is not available when there is no wideband connection.

2.3.10.1.3 RDA Alarms Button. Click on the RDA Alarms button to open the RDA Alarms window. The RDA Alarms window contains color-coded lists of the most recent RDA alarm messages. The check boxes near the top of the alarm list allow the user to select which type(s) of RDA alarm will be shown in the alarm list table. See paragraph [2.3.10.2](#) for more detail on the RDA Alarms window.

2.3.10.1.4 Moments Button. Click on the Moments button and the Moments window will open. See [Figure 2-27](#). The Moments window is used to select those data moments which are to be sent from the RDA to the RPG. The top row contains two buttons, Close and Apply. The Close button closes the Moments window and returns the user to the RDA Control/Status window. The Apply button is selected after the choices have been made. By default, all three moments (Reflectivity, Velocity, and Spectrum Width) are enabled. These are displayed by having check marks in the box to the left of the title of each moment. These boxes act as a toggle. Clicking on the box or on the title itself will deselect the moment and remove the check mark in the box. Clicking on it again will select the moment and cause the check mark to appear in the box. Any combination of moments can be selected by the user.



Figure 2-27. Moments

Once the moments have been selected (or deselected), click on the Apply button. A warning_popup opens that states: "You are about to change the transmitted moments. These changes will not take effect until the start of the next volume scan. Do you want to continue?" Click on either the Yes or No button to select the desired response. Click Yes to send the command to the RDA to implement the change(s) at the start of the next volume scan, return the user to the Moments window, and display the message: "Requesting data transmission change" in the feedback line in the RPG Control/Status window. Click No to not implement the change(s) and return to the Moments window. If the user makes changes within this window but then clicks on the Close button without clicking on the Apply button first, no change will take effect. There are no warning_popups to state that changes were made but not saved or applied.

If the wideband is disconnected or the RDA has control, the Moments button will be grayed-out and the functionality desensitized. Clicking on it will not open the Moments window.

2.3.10.1.5 VCP Button. Click on the VCP button to bring up the VCP Control window. See [Figure 2-28](#).

VCP Control

Close Auto PRF: ☒ On ☐ Off

CHANGE to RDA VCP

Precipitation: 11 21

Clear Air: 31 32

Maintenance: 300

DOWNLOAD VCP from RPG

Precipitation: 11 12 21 121

Clear Air: 31 32

Maintenance: 300

Modify VCP: Current Adaptation

Restart: VCP Elevation

Figure 2-28. VCP Control

A full description of the VCP Control window can be found in paragraph 2.3.6.1.

2.3.10.1.6 RDA State. This section of the RDA Control/Status window reflects the current state of the RDA. See Figure 2-29.

RDA State

State: Operate

☐ standby ☐ offline operate

☐ Restart ☐ Playback

☐ operate

Figure 2-29. RDA State

Beneath the "RDA State" label is a highlighted label indicating the current RDA state. Beneath the highlighted label is a group of buttons that are used to control the RDA state. The selectable

RDA states are: Standby, Restart, Operate, Offline Operate, and Playback. If the wideband is not connected or if no RDA status information is available, the label is displayed as Unknown. If the status is Unknown or if the RDA control state is local, all RDA State buttons are grayed-out and desensitized. If the RDA is in the process of restarting, the label is displayed as "Start-Up". If the RDA-RPG wideband link is connected and the RDA control state is remote or either, all RDA State buttons are sensitized except the one matching the current RDA state.

2.3.10.1.6.1 RDA Standby. To command the RDA to go into a standby state click on the Standby button. A warning_popup appears that states: "You are about to change the RDA state. Do you want to continue?". Click Yes to send a command to the RDA requesting the RDA state to be changed to Standby. The message "Change RDA to Standby state" will be displayed in the feedback line of the RPG Control/Status window. When the RDA state changes, a message will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA Status displayed above the radome in the RPG Control/Status window will be updated. The RDA Control/Status window will also be updated. The Standby button will be desensitized. The RDA control state will change to Either. Click No to abort the request. The Standby button will remain sensitized.

NOTE

The Operate and Offline Operate commands are the only ways to regain remote control when the RDA is in a standby state.

2.3.10.1.6.2 RDA Restart. To command the RDA to go into a restart state click the Restart button. A warning_popup appears that states: "You are about to change the RDA state. Do you want to continue?". Click Yes to send a command to the RDA requesting the RDA to be restarted. The message "Change RDA to Restart state" will be displayed in the feedback line of the RPG Control/Status window. The RDA-RPG wideband link will disconnect, the RDA State label will change to Unknown and all RDA control buttons in the RDA Control/Status window will be grayed-out and desensitized. When the RDA completes its restart, the RDA will go to a standby state and the RDA-RPG wideband link will be connected. The RDA Status displayed above the radome in the RPG Control/Status window will be updated. The RDA Control/Status window will also be updated. The "Standby" radio button will be grayed-out and desensitized. Click No to abort the request. The Restart button will remain sensitized.

2.3.10.1.6.3 RDA Operate. To command the RDA to go into an operate state click the Operate button. A warning_popup appears that states: "You are about to change the RDA state. Do you want to continue?". Click Yes to send a command to the RDA requesting the RDA state to be changed to operate. The message "Change RDA to Operate state" will be displayed in the feedback line of the RPG Control/Status window. When the RDA state changes, a message will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA Status displayed above the radome in the RPG Control/Status window will be updated. The RDA-RPG wideband link will indicate data flow between the RDA and RPG as indicated by boxes moving from the RDA to the RPG icons. The azimuth indicator inside the radome will be active as indicated by the drawing of a black circle inside the outer edge. The RDA Control/Status window will also be updated. The Operate button will be grayed-out and desensitized. Click No to abort the request. The Operate button will remain sensitized.

2.3.10.1.6.4 RDA Offline Operate. To command the RDA to go into a offline operate state click the Offline Operate button. A warning_popup appears that states: "You are about to change the RDA state. Do you want to continue?". Click yes to send a command to the RDA requesting the RDA state to be changed to offline operate. The message "Change RDA to Standby state" will be displayed in the feedback line of the RPG Control/Status window. When the RDA state changes, a message will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA Status displayed above the radome in the RPG Control/Status window will be updated. The RDA Control/Status window will also be updated. The Offline Operate button will be grayed-out and desensitized. Click No to abort the request. The Offline Operate radio button will remain sensitized.

NOTE

This function is not applicable with an EEC RDA.

2.3.10.1.7 RDA Control. Beneath the RDA Control label are a pair of buttons to control who has control of the RDA. Above the buttons is a highlighted label indicating the current RDA control status. The possible RDA control states are: Local (RDA), Remote (RPG), and Either. The state that is highlighted will be grayed-out and desensitized in the lower part of the section. If the RDA-RPG wideband link is not connected or if no RDA status information is available, the label is displayed as Unknown and both options in the lower part will be grayed-out and desensitized. See [Figure 2-30](#).



Figure 2-30. RDA Control

2.3.10.1.7.1 Enable Local (RDA) Button. When the RDA control state is remote (RPG), the RPG operator can enable the RDA to take control of the RDA by clicking on the Enable Local (RDA) button. When clicked, a command is sent to the RDA enabling local control of the RDA; no warning_popup is displayed. The message "Enable RDA control of RDA" is displayed in the feedback line of the RPG Control/Status window.

2.3.10.1.7.2 Select Remote (RPG) Button. When the RDA control state is local (RDA), the RPG operator can request the RDA to enable remote control from the RPG by selecting the Select Remote (RPG) button. When clicked, a command is sent to the RDA requesting the enabling of remote control of the RDA; no warning_popup is displayed. The message "Request RPG to control RDA" is displayed in the feedback line of the RPG Control/Status window.

2.3.10.1.7.3 Control Either. When the control label reads "Either", then either the RDA or RPG has control and both buttons in the RDA Control section will be grayed-out and desensitized. This option can be obtained by the following procedure. When at the RDA Control/Status window and the RPG is in control, the control label will read "Remote (RPG)" and the Enable Local (RDA) option will be sensitized. Click on the Enable Local (RDA), and the label will change to Either until either the RDA accepts control or a timer of approximately 4 ½ minutes expires. If the RDA accepts control, then the label switches to Local (RDA) and the Select Remote (RPG) button becomes sensitized. If the timer expires without any action at the RDA, the label switches back to Remote (RPG) and the Enable Local (RDA) button becomes sensitized again. See [Figure 2-31](#).

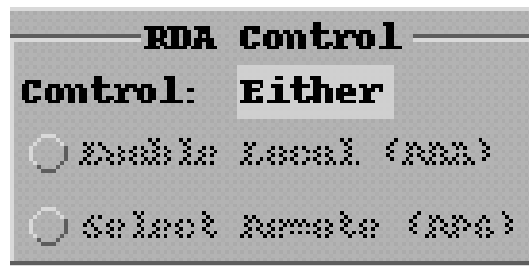


Figure 2-31. RDA Control - Either

2.3.10.1.8 RDA Power Source. Beneath the "RDA Power Source" label are a pair of buttons to control the power source for the RDA. If the RDA-RPG wideband link is not connected or if the RDA control state is local, both buttons are grayed-out and desensitized. Otherwise, only the button corresponding to the current RDA power source is grayed-out and desensitized. Above the buttons is a highlighted status label indicating the current RDA power source. The possible RDA power source states are: Utility and Auxiliary. If the RDA-RPG wideband link is not connected or if no RDA status information is available, the label is displayed as Unknown. See [Figure 2-32](#).

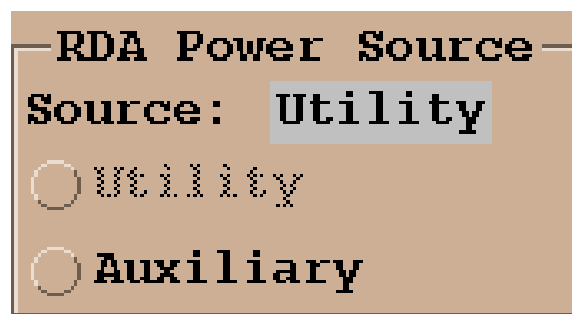


Figure 2-32. RDA Power Source

Information about the RDA power source is also displayed graphically in the RPG Control/Status window (paragraph [2.3.2](#)).

2.3.10.1.8.1 Utility Button. When the RDA power source is auxiliary, the operator can request the RDA power source to change to utility by clicking the Utility button. When clicked, a warning_popup appears that states: "You are about to change the RDA power source. Do you want to continue?". Click Yes to send a command to the RDA requesting the RDA power source to be changed to utility. The message "Request switch to Utility Power" will be displayed in the feedback line of the RPG Control/Status window. When the RDA power source changes, a message will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA power source graphic displayed to the left of the RDA icon in the RPG Control/Status window will be updated. The RDA Control/Status window will also be updated. The Utility button will be grayed-out and desensitized and the Auxiliary button will be sensitized. Click No to abort the request. The Utility button will remain sensitized and the "Auxiliary" radio will remain desensitized.

2.3.10.1.8.2 Auxiliary Button. When the RDA power source is utility, the operator can request the RDA power source to change to auxiliary by clicking the Auxiliary button. When clicked, a warning_popup appears that states: "You are about to change the RDA power source. Do you want to continue?". Click Yes to send a command to the RDA requesting the RDA power source to be changed to auxiliary. The message "Request switch to Auxiliary Power" will be displayed in the feedback line of the RPG Control/Status window. When the RDA power source changes, a message will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA power source graphic displayed to the left of the RDA icon in the RPG Control/Status window will be updated. The RDA Control/Status window will also be updated. The Auxiliary button will be desensitized and the Utility button will be sensitized. Click No to abort the request. The Auxiliary button will remain sensitized and the Utility button will remain desensitized.

2.3.10.1.9 Interference Suppression. Beneath the Interference Suppression label are a pair of buttons to enable/disable the Interference Suppression Unit (ISU) at the RDA. If the RDA-RPG wideband link is not connected or if the RDA control state is local, both buttons are grayed-out and desensitized. Otherwise, only the button corresponding to the current ISU state is desensitized. Above the buttons is a highlighted label indicating the current ISU status. The possible ISU states are Enabled and Disabled. If the RDA-RPG wideband link is not connected or if no RDA status information is available, the label is displayed as Unknown. See [Figure 2-33](#).

NOTE

This function is not applicable with an EEC RDA, or where ISU is not installed.

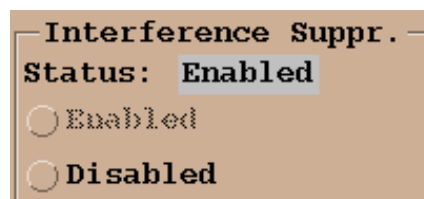


Figure 2-33. Interference Suppression

2.3.10.1.9.1 Enabled ISU Button. When the ISU state is disabled, the operator can request the ISU to be enabled by clicking on the Enabled button. A warning_popup will appear that states: "You are about to issue a request to disable interference suppression. Do you want to continue?".

Click Yes to send a command to the RDA requesting the ISU to be disabled. The message "Disable Interference Suppression Unit" is displayed in the feedback line of the RPG Control/Status window. When the RDA disables the ISU, a message will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA Control/Status window will be updated. The Disabled button will be desensitized and the Enabled button will be sensitized. Click No to abort the request. The Enabled button will remain sensitized and the Disabled button will remain desensitized.

2.3.10.1.9.2 Disabled ISU Button. When the ISU state is enabled, the operator can request the ISU to be disabled by clicking the Disabled button. A warning_popup will appear that states: "You are about to issue a request to enable interference suppression. Do you want to continue?". Click

Yes to send a command to the RDA requesting the ISU to be enabled. The message "Enable Interference Suppression Unit" is displayed in the feedback line of the RPG Control/Status window. When the RDA enables the ISU, a message will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA Control/Status window will be updated. The Enabled radio button will be grayed-out and desensitized and the Disabled button will be sensitized. Click No to abort the request. The Disabled button will remain sensitized and the Enabled button will remain desensitized.

2.3.10.1.10 Calibration. Beneath the Calibration label are a pair of buttons to change the reflectivity calibration mode at the RDA. If the RDA-RPG wideband link is not connected or if the RDA control state is local, both radio buttons are desensitized. Otherwise, only the button corresponding to the current reflectivity calibration mode is desensitized. Above the buttons is a highlighted label indicating the current reflectivity calibration status. The possible reflectivity calibration modes are Automatic and Manual. If the RDA-RPG wideband link is not connected or if no RDA status information is available, the label is displayed as Unknown. Information about the RDA reflectivity calibration mode is also displayed graphically in the RPG Control/Status window, lower right hand corner, text lines. See [Figure 2-34](#).

NOTE

This function is not applicable with an EEC RDA.

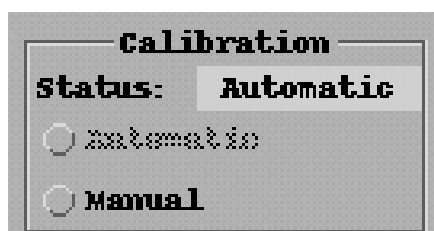


Figure 2-34. Calibration

2.3.10.1.10.1 Automatic Calibration Button. When the reflectivity calibration mode is manual, the operator can request the reflectivity calibration mode to be automatic by clicking the Automatic button. A warning_popup appears that states: "You are about to enable Auto Calibration. It will take effect at the start of the next volume scan. Do you want to continue?".

Click Yes to send a command to the RDA requesting automatic reflectivity calibration to be enabled. The message "Enable Auto-calibration" is displayed in the feedback line of the RPG Control/Status window. At the beginning of the next volume scan, a message will be written to the system status log indicating the new reflectivity calibration state and displayed in the status line of the RPG Control/Status window. The RDA Control/Status window will be updated. The Automatic button will be desensitized and the Manual button will be sensitized. Click No to abort the request. The Automatic and Manual buttons will remain sensitized.

2.3.10.1.10.2 Manual Calibration Button. When the reflectivity calibration mode is manual or automatic, the operator can request the RDA to use an operator defined reflectivity calibration value by clicking the Manual button. When clicked, the Reflectivity Calibration (Refl Calib) window appears. See Figure 2-35.

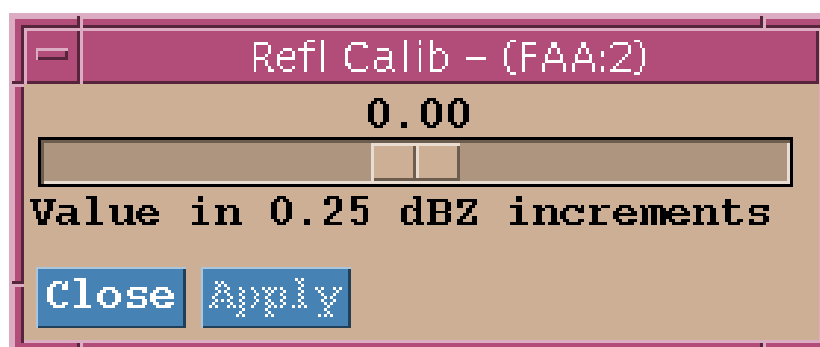


Figure 2-35. Reflectivity Calibration

The Refl Calib window contains a slider bar and Close and Apply buttons. The Close button is sensitized and when clicked, returns the user to the HCI. The Apply button is grayed-out and desensitized until a manual input has been made on the slider bar. Then it becomes sensitized. The user can define a manual calibration in the range -10 to +10 dBZ by moving the slider to the

left or right using the left mouse button. When the left mouse button is released, the calibration value is rounded to the nearest 0.25 dBZ and displayed above the slider bar. To invoke the manual reflectivity calibration, click the Apply button. A warning_popup appears that states: "You are about to change to a manual calibration. It will take effect at the start of the next volume scan. Do you want to continue?".

Click Yes to send a command to the RDA requesting the manual reflectivity calibration be used. The message "Calibration correction set to X.XX" where "X.XX" is the reflectivity calibration value, is displayed in the feedback line of the RPG Control/Status window. When the RDA begins the next volume scan, a message indicating that the reflectivity calibration state has been changed will be written to the system status log and displayed in the status line of the RPG Control/Status window. The RDA Control/Status window will be updated. The Automatic and Manual buttons will be sensitized. The Refl Calib window remains open. Click No to abort the request. The Automatic and Manual buttons will be sensitized if the reflectivity calibration state is manual (the manual button remains sensitized in manual mode so the user can change the reflectivity calibration value). If the state is Automatic, only the Manual button will be sensitized. Click on the Close button to close the Refl Calib window.

2.3.10.1.11 FAA Redundant Control. If the configuration is FAA Redundant, a set of buttons and labels are displayed to the right of the RDA Control section. At the top is the label Redundant Control. Beneath the Redundant Control label are two groups of labels and buttons titled Local Channel and Redundant Channel. There is additional information available in paragraph [2.7.3.3](#).

Within the Local Channel group are two labels, Status and Adapt and one or two buttons, depending on the channel. The Status label can have one of two states, Controlling and Non-Controlling. The Adapt label contains the date and time of the last adaptation data update.

2.3.10.1.11.1 FAA Channel 1. If the local channel is 1, only one button, Controlling, is defined since only the primary channel, 2, can be commanded into a non-controlling state. The button is grayed-out and desensitized when the local channel status is Controlling. If the local channel status is Non-controlling, the Controlling radio button is sensitized. Clicking it makes a warning_popup appear that states: "You are about to change the control state of this channel. Do you want to continue?".

Click Yes will send a command to the RDA requesting Channel 1 be controlling. The message "Command RDA Channel 1 to Controlling" is displayed in the feedback line of the RPG Control/Status window. The RDA will send an acknowledgment to the RPG which will be written to the system status log and displayed in the status line of the RPG Control/Status window. The Controlling button will become grayed-out and desensitized. The local RPG obtains the narrowband/wideband relay and goes active. Click No to abort the request. The Controlling button will remain sensitized.

2.3.10.1.11.2 FAA Channel 2. If the local channel is 2, two buttons, Controlling and Non-controlling are defined since the primary channel, 2, can be commanded into a non-controlling state. The Controlling button is grayed-out and desensitized and the Non-controlling button is sensitized when the local channel status is Controlling. If the local channel status is Non-controlling,

the Controlling button is sensitized and the Non-controlling button is grayed-out and desensitized. Clicking either one makes a warning_popup appear that states: "You are about to change the control state of this channel. Do you want to continue?".

Click Yes to send a command to the RDA requesting Channel 2 be controlling if Controlling was clicked and non-controlling if Non-controlling was clicked. The message "Command RDA Channel 2 to Controlling" is displayed in the feedback line of the RPG Control/Status window if Controlling was selected and the message "Command RDA Channel 2 to Non-controlling" is displayed in the feedback line of the RPG Control/Status window if Non-controlling was selected. The RDA will send an acknowledgment to the RPG which will be written to the system status log and displayed in the status line of the RPG Control/Status window. The Controlling button will be sensitized when the local channel control state becomes non-controlling and desensitized when the local channel control state becomes controlling. The Non-controlling button will be sensitized when the local channel control state becomes controlling and desensitized when the local channel control state becomes non-controlling. The local RPG obtains the narrowband/wideband relay and goes active if the local channel becomes controlling. Click No to abort the request. The button sensitivities will remain the same.

2.3.10.1.11.3 FAA Redundant Channel Status and Adapt. Within the Redundant Channel group are two labels, Status and Adapt. The information to the right of these labels indicate the current state of the redundant channel. The Status label can have one of two states, Controlling and Non-controlling. The Adapt label contains the date and time of the last adaptation data update on the redundant channel. If the adaptation data update times on the local and redundant channels are different, they are displayed with a red background.

2.3.10.1.12 Additional RDA Status Information. Beneath the different RDA control groups are six pair of labels displaying additional RDA status information. Each label pair consists of a name followed by a corresponding status. The status is displayed with a white background to distinguish it from the label. If the RDA-RPG wideband link is in a failed state, or if no RDA status messages have been received by the RPG, no status is reported for all items. See [Figure 2-36](#).

Operational Mode:	Operational	Calib. Correction:	-1.00 dB
Control Authority:	No Action	Interference Rate:	1996/sec
Transmitter Power:	1410 Watts	Moments Enabled:	RVW

Figure 2-36. Additional RDA Status Information

2.3.10.1.12.1 Operational Mode. Displayed to the right of the Operational Mode label is the RDA operational mode. The possible modes are Operational and Maintenance. When the RDA is in operational mode, the RPG will be in one of the RPG test modes.

2.3.10.1.12.2 Control Authority. Displayed to the right of the Control Authority label is the RDA control authority state. The possible states are No Action, Local Requested, and Remote Enabled.

When the RPG is in remote control of the RDA and the RDA operator requests local control, a new RDA status message is sent from the RDA to the RPG indicating local RDA control is requested. The label Local Requested is displayed for the control authority state. After the RPG operator enables local control (see paragraph 2.3.10.1.7.1) and the RDA takes control of the RDA, a new RDA status message is sent by the RDA to the RPG indicating the RDA is in local control and No Action is displayed for the control authority state.

When the RDA is in local control and the RDA operator enables remote control, a new RDA status message is sent from the RDA to the RPG indicating remote control is enabled. The label Remote Enabled is displayed for the RDA control authority state. Once the RPG takes control of the RDA, a new RDA status message is sent by the RDA to the RPG setting the control authority state to No Action.

2.3.10.1.12.3 Transmitter Power. Displayed to the right of the Transmitter Power label is the RDA transmitter power. The power is displayed in watts.

2.3.10.1.12.4 Calib. Correction. Displayed to the right of the Calib. Correction label is the reflectivity calibration value used by the RDA. The reflectivity calibration value is displayed in decibels (dB). If the calibration mode is manual, the value is the same as that defined by the operator. If the calibration mode is automatic, the value is updated every volume scan by the RDA software.

2.3.10.1.12.5 Interference Rate. Displayed to the right of the Interference Rate label is the interference suppression rate. The interference suppression rate value is displayed in units per second. If interference suppression is enabled, the value should be updated every volume scan by the RDA software.

2.3.10.1.12.6 Moments Enabled. Displayed to the right of the Moments Enabled label are a coded list of the moments currently enabled for transmission by the RDA. The following codes are used to represent each moment:

R - Reflectivity
V - Velocity
W - Spectrum Width

For example, if the code list is "RVW", all three moments are enabled for transmission.

2.3.10.2 RDA Alarms. Click on the Alarms button in the RDA icon to open the RDA Alarms window. The RDA Alarms window consists of a number of buttons and edit boxes and a scrolled list of color coded RDA alarm messages. See Figure 2-37. The upper left hand corner contains the Close button. Click on this button and the operator is returned to the HCI. All changes made to this menu are automatically saved.

RDA Alarms - (FAA:2)

Close

Maximum Displayable Alarms:

Filter Parameters

MMDDYY: / / HHMMSS: : :

Search:

Clear

Device

☒ ARC ☒ CTR ☒ PED ☒ RSP ☒ USR
☒ UTL ☒ MID ☒ XMT

Alarm Code Color: SEC MR MM INOP

RDA Date/Time	Device	Type	Code	Description
7/21/2004 14:09:22	[XMT]	[E]	[204]	-- RDA:2 ALARM CLEARED: ANTENNA PEAK POWER LOW
7/21/2004 14:08:49	[XMT]	[E]	[204]	-- RDA:2 ALARM ACTIVATED: ANTENNA PEAK POWER LOW
7/20/2004 23:26:35	[RSP]	[E]	[471]	-- RDA:2 ALARM CLEARED: SYSTEM NOISE TEMP DEGRADED
7/20/2004 23:26:30	[PED]	[E]	[327]	-- RDA:2 ALARM CLEARED: ENCODER +5V POWER SUPPLY FAIL
7/20/2004 23:26:30	[PED]	[E]	[330]	-- RDA:2 ALARM CLEARED: PEDESTAL +15V POWER SUPPLY 1 FAIL
7/20/2004 23:23:10	[CTR]	[E]	[207]	-- RDA:2 ALARM CLEARED: ANTENNA POWER METER ZERO OUT OF LIMIT
7/20/2004 23:20:49	[CTR]	[E]	[207]	-- RDA:2 ALARM ACTIVATED: ANTENNA POWER METER ZERO OUT OF LIMIT
7/20/2004 22:44:19	[RSP]	[E]	[471]	-- RDA:2 ALARM ACTIVATED: SYSTEM NOISE TEMP DEGRADED
7/20/2004 22:44:17	[PED]	[E]	[327]	-- RDA:2 ALARM ACTIVATED: ENCODER +5V POWER SUPPLY FAIL
7/20/2004 22:44:17	[PED]	[E]	[330]	-- RDA:2 ALARM ACTIVATED: PEDESTAL +15V POWER SUPPLY 1 FAIL
7/20/2004 21:48:37	[XMT]	[E]	[204]	-- RDA:2 ALARM CLEARED: ANTENNA PEAK POWER LOW
7/20/2004 21:43:03	[XMT]	[E]	[208]	-- RDA:2 ALARM ACTIVATED: XMTR/ANT PWR RATIO DEGRADED

Type: E = Edge Detect, O = Occurrence, F = Filtered Occurrence

Figure 2-37. RDA Alarms

2.3.10.2.1 Maximum Displayable Alarms. To the right of the Close button is an edit box preceded by the label Maximum Displayable Alarms. This edit box controls the number of color coded RDA alarm messages contained in the scrolled list. By default, a maximum of 500 RDA alarm messages can exist in the scrolled list. Any number in the range 0 - 9999 is accepted. However, it should be noted that the larger the number is, the longer the scrolled list will take to refresh when new RDA alarms are received by the RPG.

2.3.10.2.2 Device. Above the RDA alarm messages scrolled list are a set of check boxes and a button inside a section labeled Device. These boxes and buttons are used to control which RDA alarm messages are displayed in the RDA alarm messages scrolled list. A check box is defined for each RDA defined device. Each device is identified by a mnemonic which is defined as follows:

- ARC - Archive
- CTR - RDA Control
- PED - Antenna/Pedestal
- RSP - Receiver/Signal Processor
- USR - User
- UTL - Tower/Utilities
- WID - Wideband
- XMT - Transmitter

All RDA alarm messages map to one of the aforementioned RDA devices. Only those RDA alarm messages corresponding to a selected (checked) RDA device are displayed in the scrolled list.

Following the last RDA device selection is a button containing either the label All or None. Clicking on this button when the label is None will deselect all RDA device selections and no RDA alarm messages will be displayed in the scrolled list. Clicking on this button when the label is All will select all RDA device selections and all RDA alarm messages (up to the maximum defined) will be displayed in the scrolled list. After clicking this button, the label will change to the other state.

2.3.10.2.3 Filter Parameters. To the right of the Device section is a section labeled Filter Parameters. This section contains a set of edit boxes used to control the age and content of the messages displayed in the scrolled list.

The user can control the date and time of the latest messages in the list by entering a date in the MMDDYY edit boxes and a time in the HHMMSS edit boxes. If the date/time fields are blank, no date/time check is performed. Normal range checking is performed on each date/time field. Only the last two digits of the year should be entered. If an invalid date/time element is entered (for this example, an invalid month), a warning_popup window appears which states: "You entered an invalid month (XX). The valid range is 0 (ignore) to 12". Similar warning_popups appear for invalid days, hours, minutes, and seconds. There is no warning_popup for years. Click on the Continue button to return to the edit box.

The user can control which messages are displayed, by content, by specifying a search string field in the edit box to the right of the Search: label. For example, if the search string is "VCP", only those RDA messages containing the string "VCP" are displayed in the scrolled list. NOTE The search string is not case sensitive (i.e., "VCP", "vCP", "vcP", "vcp", "Vcp", and "VCp" are all considered the same).

The user can quickly clear all filter parameters by selecting the Clear button. All date/time and search fields are removed. No messages are filtered in the scrolled list. The user remains at the RDA Alarms window.

2.3.10.2.3.1 MMDDYY Blocks. At the MMDDYY blocks, type in the two digit month, day, and the year for the desired date. When the Return key is pushed, the log of alarms will change to show only those alarms with the specified date or earlier.

2.3.10.2.3.2 HHMMSS Blocks. At the HHMMSS blocks, type in the desired time, using digits each for hour (HH), minutes (MM) and seconds (SS). When the Return key is pushed, the log of alarms will change to only show those alarms at that specific time or earlier.

2.3.10.2.3.3 Search Block. In the Search block, type in the keystrokes to be used in the search of the alarms. When the Return key is pushed, the word or string will search through the Description column of the Alarm listing and then list only the alarms that have the specific word or string in its description. The entry is not case sensitive.

2.3.10.2.3.4 Clear Button. In the lower right hand corner is a Clear button. One click on this Clear button and the entries from the other three blocks (Date, Time, and Search) are all cleared and the corresponding lists of alarms cleared.

2.3.10.2.4 RDA Alarm Messages Scrolled List. Beneath the device and filter parameter sections are a set of labels and a color coded scrolled list of RDA alarm messages. The labels are used to describe the contents of the messages. One set of labels define the message colors and their meaning. These are:

- SEC - Secondary alarms (normal background color)
- MR - Maintenance Required alarms (yellow background color)
- MM - Maintenance Mandatory alarms (orange background color)
- INOP - Inoperable alarms (red background color)

Just above the scrolled list are a set of labels defining each part of an RDA alarm message entry. These are: RDA Date/Time, Device, Type, Code, and Description.

The RDA Date/Time field corresponds to the RDA date and time (UT) the message was generated. Note: The RDA and RPG times can be considerably different since they are generated from independent clocks. One can determine the time difference by comparing a specific message time in the RDA Alarms and RPG Status (all RDA alarm messages are written to the RPG system log file and are tagged with the time they were received at the RPG) windows.

The Device field defines which RDA device the RDA alarm message is tied to. These devices have been described in paragraph [2.3.10.2.2](#).

The Type field defines the RDA alarm type from one of the following:

- E - Edge Detected
- O - Occurrence
- F - Filtered Occurrence

Edge Detected alarms are reported by the RDA as activated every time the test associated with the alarm fails consecutively for a specific number of times. When the test first passes after an alarm is reported as activated, the alarm is reported as cleared.

Occurrence alarms are reported as activated each time the outcome of the associated test is failed. No corresponding cleared alarm is reported when the condition does not fail.

Filtered Occurrence alarms are reported each time the outcome of the associated test is failed, but are not reported within 15 minutes of the last reporting. No corresponding cleared alarm is reported when the condition does not fail.

The Code field is the integer code reported by the RDA corresponding to the RDA alarm being reported. Up to 800 RDA alarm codes are defined in the RDA/RPG Interface Control Document (ICD).

The Description field maps the RDA alarm code to a descriptive message. The message is preceded by the string "RDA ALARM ACTIVATED" when an alarm is set and "RDA ALARM CLEARED" when an alarm is cleared. Not all RDA alarms are cleared.

Entries in the RDA alarm messages scrolled list are displayed in reverse chronological order (newest first and oldest last). The list is automatically updated when new RDA alarms are reported.

2.3.11 RDA Power Source Icons.

Just to the left of the RDA icon is a graphic representing the current power source of the RDA shelter. The two utility poles with connecting wires graphically represents the utility or commercial power source. The shelter and fuel tank graphic represents the generator or auxiliary power source and fuel level. A message below the graphics inform the user of the status of the power. When the utility poles are present, the message will read: Gen Off. When the generator and fuel tank is present, the message will read: Util Avail. If there is no wideband connection between the RDA and RPG, then this entire box is blank. See [Figure 2-38](#).



Figure 2-38. RDA Power Source Icons

When the text line reads Gen Off, it in fact may not be off if it is being exercised or is during a cooling down period. When the text line reads Util Avail, utility power may not be available due to factors external to the WSR-88D site.

If the RPG software has control of the RDA, the power source may be changed to auxiliary or to utility by clicking anywhere in the graphic when the pointing hand is available. A warning_popup will appear that states: “You are about to change the RDA power source. Do you want to continue?” Click on either the Yes or No button to select the desired response. If the user is on utility power and selects to change to generator, then the message under the utility poles will change to “Gen On” once the generator is on, and the graphic will change to the generator building and fuel tank once the power has been transferred.

For sites with Transitional Power Source (TPS), the RDA will not be powered down during a power transfer. With the TPS operational, manual switching from generator to utility is not necessary. The TPS automatically checks the utility power every ten minutes. If it is adequate, then the RDA is switched over to utility from generator. Even if manually selected to go off generator, the operator will see no change in power source until the TPS does its check. For sites without TPS, the RDA will shut off because its power source is removed temporarily. When power is restored, the RDA returns to the mode it was in before it lost power (either Standby or Operate). It is recommended to put the RDA in Standby when conducting a power transfer as that is an easier transition on the equipment.

2.3.12 RDA/RPG Interface Status.

The connection between the RDA and RPG is represented both graphically and textually. There are three bars that represent the three base data moments. See [Figure 2-39](#). The top bar, labeled “R”, represents Reflectivity. The middle bar, labeled “V”, represents Velocity. The bottom bar, labeled “W”, represents Spectrum Width. The bars are displayed in white, red, green, or no color. A white display indicates that the wideband line is connected but there is no base data flowing. A red display indicates that the moment has been disabled. All three red may indicate a failure. A green display indicates that the wideband line is connected and there is base data flowing. In addition, when the bars are green, there is an additional small black box that repeatedly moves within each bar from left to right (or from the RDA icon to the RPG icon) adding further graphical indication that base data is enabled and flowing. A missing display indicates the wideband line is not connected.

If the RDA/RPG wideband link is not connected, then the bars are replaced by a label indicating the current wideband state. The following RDA/RPG wideband link states are defined:

- Connected - The link is connected.
- Connect Pending - The link is currently being connected.
- Disconnect Pending - The link is currently being disconnected.
- Disconnect HCI - The link was disconnected by a command from the HCI operator.
- Disconnect CM - The link was disconnected by the comms manager.
- Disconnect SHUTDOWN - The link was disconnected because the RPG was shutdown.
- Failure - A link could not be established between the RDA and RPG. The probable cause is the RDA is unavailable.
- Unknown - An unrecognized link status was reported.

Click on the RDA/RPG wideband link when the cursor turns into a pointing hand (when it is over the status graphic) and the RDA/RPG Interface Control/Status window appears. See [Figure 2-40](#). This window contains selections to control the RDA/RPG wideband link.



Figure 2-39. Bars Representing Three Moments

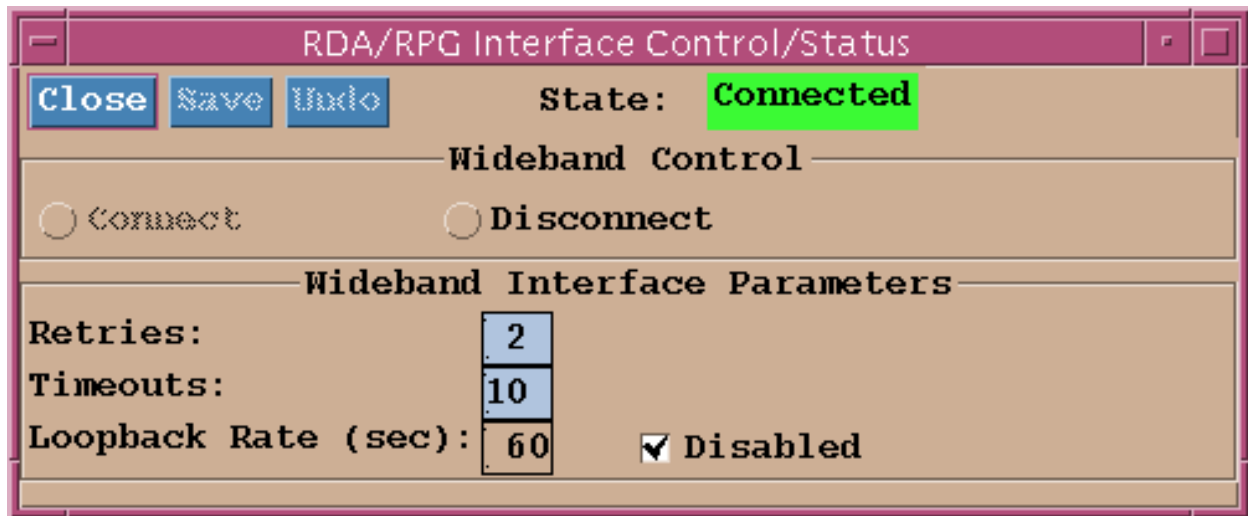


Figure 2-40. RDA/RPG Interface Control/Status

2.3.12.1 RDA/RPG Interface Control/Status Window. This window displays when you click on the RDA/RPG wideband link located between the RDA icon and the RPG icon. This window has three control buttons on the top line, followed by a text line defining the state of the Interface.

Clicking on the Close button closes the RDA/RPG Interface Control/Status window. If any edits were made to the wideband interface parameters but not saved, a warning_popup appears that states: "Do you want to save your changes?". Clicking Yes will first save the edits before closing the window. Clicking No will discard the edits and close the window.

The Save button is only sensitized when edits have been made to the wideband interface parameters. Clicking it will make a warning_popup appear that states: "Do you want to save your changes?". Click Yes will save the edits to a file. The Save and Undo buttons then become grayed-out and desensitized. Click No will not save the edits but leave them intact in the window. The Save and Undo buttons will remain sensitized.

The Undo button is only sensitized when edits have been made to the wideband interface parameters. When selected, all unsaved edits are discarded. No warning_popup window appears. The Save and Undo buttons become desensitized.

2.3.12.1.1 State Text. The current RDA/RPG wideband link state is displayed at the top of the window to the right of the State: label. The state is displayed as a color coded text string. The following color coded RDA/RPG wideband link states are defined:

Connected	- Green
Connect Pending	- Yellow
Disconnect Pending	- Yellow
Disconnected (HCI)	- Yellow

Disconnected (CM)	- Yellow
Disconnected (SHUTDOWN)	- Yellow
Failure	- Red
Unknown	- Red

2.3.12.1.2 Wideband Control Buttons. The Wideband Control buttons are used to connect and disconnect the RDA/RPG wideband link. These radio buttons are always sensitized, regardless of the RDA/RPG wideband link state.

2.3.12.1.2.1 Wideband Connect Button. Click on the Connect button and a warning_popup appears that states: "You are about to issue a request to enable the connection between the RDA and RPG. Do you want to continue?"

Click Yes to send a command to connect the RDA/RPG wideband link. The message "Connect Wideband Link" is displayed in the feedback line of the RPG Control/Status window. The message "Wideband Line is CONNECTED" is written to the RPG system status log and displayed in the status line of the RPG Control/Status window as soon as the wideband line is connected. The wideband link graphic in the RPG Control/Status window should change from a label to a set of horizontal bars. The State label in the RDA/RPG Interface Control/Status window should change to "Connected".

Click No to abort the connect request.

2.3.12.1.2.2 Wideband Disconnect Button. Click on the Disconnect button and a warning_popup appears that states: "You are about to issue a request to disable the connection between the RDA and RPG. Do you want to continue?"

Click Yes to send a command to disconnect the RDA/RPG wideband link. The message "Disconnect wideband link" is displayed in the feedback line of the RPG Control/Status window. The message "Wideband Line DISCONNECTED by HCI" is written to the RPG system status log and displayed in the status line of the RPG Control/Status window as soon as the wideband line is disconnected. The wideband link graphic in the RPG Control/Status window should change from a set of horizontal bars to the label Disconnected HCI. The State label in the RDA/RPG Interface Control/Status window should change to Disconnected (HCI).

Click No to abort the disconnect request.

2.3.12.1.3 Wideband Interface Parameters. The group of items in the Wideband Interface Parameters section are used to control how the RDA control process monitors the RDA/RPG wideband link.

2.3.12.1.3.1 Retries. The user can control the number of times the RDA control task attempts to connect the wideband communications link before it reports a failed status by changing the edit field to the right of the Retries: label. The valid range is 0 to 5. Any value outside this range results in a warning_popup appearing that states: "X is out of range, must be in the range 0 <= X

≤ 5 .", where X is the input value. Click on the Continue button to return to the same Retries field for another entry.

2.3.12.1.3.2 Timeouts. The user can control the number of seconds the RDA control task will wait before it considers a response to a RDA control command overdue by changing the edit field to the right of the Timeouts: label. The valid range is 1 to 30. Any value outside the range results in a warning_popup appearing that states: "X is out of range, must be in the range $1 \leq X \leq 30$ ", where X is the input value. Click on the Continue button to return to the same Timeouts field for another entry.

2.3.12.1.3.3 Loopback Rate. The user can control the rate at which loopback messages are passed between the RDA and RPG by changing the edit and check box fields to the right of the Loopback Rate (sec): label. If the Disabled box is checked (set), loopback tests are disabled. If the Disabled box is not checked (not set), loopback tests are enabled and the user can specify a loopback rate in the range 60 to 300 seconds. Any value outside the range results in a warning_popup appearing that states: "X is out of range, must be in the range $60 \leq X \leq 300$ ", where X is the input value. Click on the Continue button to return to the same Loopback Rate field for another entry.

2.3.13 RPG Icon.

The middle third of the RPG Control/Status window is devoted to RPG specific items. See [Figure 2-41](#). The display consists of a set of control buttons. These are the RPG Control button, RPG Products button, and RPG Status button. The Control button opens up the RPG Control window that controls the RPG. The Products button has two additional sets of buttons which are the Adaptation Data (Alert/Thresholds, Generation List, Load Shed Products, Selectable Parameters and Algorithms) and the Display (Products in Database). The Status button contains all the logs of the entire RPG system.

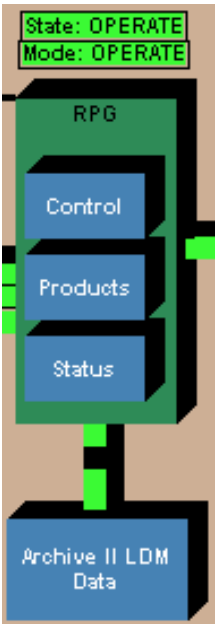


Figure 2-41. RPG Icon

For the FAA Redundant Configuration with the RMS, there is a fourth button, directly under the Status button, labeled RMS. This button is described in more detail in paragraph 2.3.13.4.

2.3.13.1 RPG Control Window. Click on the Control button in the RPG icon to open the RPG Control window. The window consists of numerous control buttons and a status region. The top line of the RPG Control window contains system information, the middle section provides various system controls, and the bottom section indicates the default weather mode. See Figure 2-42.

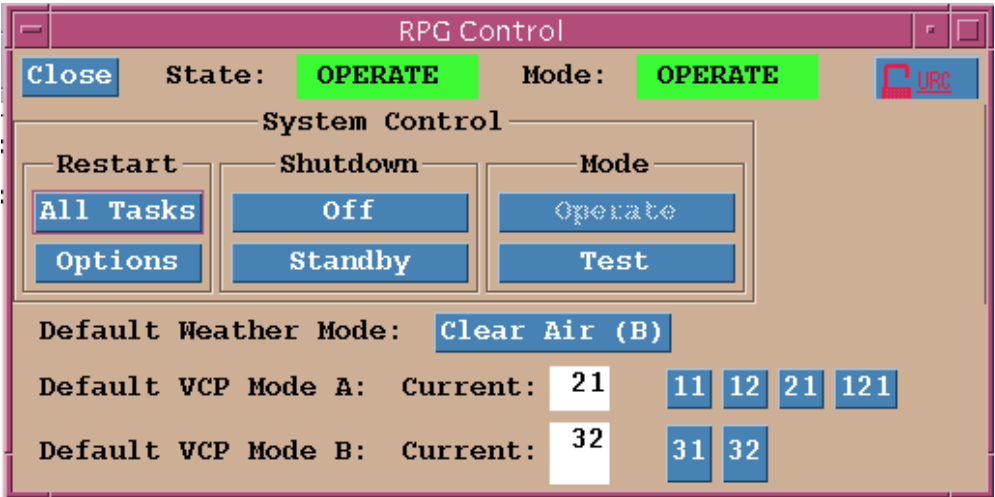


Figure 2-42. RPG Control

2.3.13.1.1 RPG Close, State, and Mode. Clicking on the Close button in the upper left hand corner will close the RPG Control window and return the user to the HCI.

The middle of the top line has a text line that displays the State of the RPG. The possible States and their respective background colors are:

- OPERATE (Green) - The RPG is operating
- SHUTDOWN (Red) - The RPG is off. Starting the RPG from this state initializes the RPG.
- STANDBY (Red) - The RPG is off. Starting the RPG from this state does not initialize the RPG.
- TRANSITION (Yellow) - The RPG is in a transition state between operate and shutdown/standby.
- FAILED (Red) - The RPG has failed for some reason.
- POWERFAIL (Red) - The power to the RPG has failed for some reason.
- UNKNOWN (Red) - The RPG state being reported is not defined.

The right hand side of the top line has a text line that defines the Mode of the RPG. The possible Modes and their respective background colors are:

- OPERATE (Green) - The RPG is operating and products can be distributed to all narrowband users.
- TEST (RDA) (Yellow) - The RPG is in test mode because the RDA is in maintenance mode. Products can only be sent to the RPGOP user.
- TEST (RPG) (Yellow) - The RPG is in test mode as a result of a command from the RPG operator. Products can only be sent to the RPGOP user.

2.3.13.1.2 RPG System Control Block. The RPG System Control block is comprised of three columns: Restart, Shutdown, and Mode. Each is discussed separately below.

2.3.13.1.2.1 RPG Restart-All Tasks. Click on the All Tasks button and a warning_popup appears if the current RPG state is OPERATE, STANDBY, or SHUTDOWN. Otherwise, no action is performed. The All Tasks button is grayed-out and desensitized when the RPG is in a TRANSITION state.

If the current RPG state is OPERATE or STANDBY, the warning_popup states: "You are about to restart all of the RPG processes. Contents of datastores will be preserved. Do you want to continue?".

Click Yes to sent a restart command to the RPG manager. If the restart command is successful, the message "RPG Restart Command Accepted" is displayed in the feedback line of the RPG Control/Status window. The RPG state will first go to TRANSITION, and then to OPERATE.

The message "RPG operability Status: COMMANDED SHUTDOWN" will first be displayed in the status line of the RPG Control/Status window. As the RPG is restarted, numerous messages will be written to the RPG system status log and displayed in the status line while in the TRANSITION state. When the state becomes OPERATE, the message "RPG State: OPERATE" will be displayed. If the restart command is not successful, the message "RPG Restart Command Failed" is displayed in the feedback line of the RPG Control/Status window.

Clicking No will close the warning_popup window and do nothing.

If the current RPG state is SHUTDOWN, the warning_popup states "You are about to start all of the RPG processes. Contents of some datastores will be reinitialized. Do you want to continue?".

Click Yes to send a startup command to the RPG manager. If the startup command is successful, the message "RPG Startup Command Accepted" is displayed in the feedback line of the RPG Control/Status window. The RPG state will first go to TRANSITION, and then to OPERATE. The message "RPG operability Status: COMMANDED SHUTDOWN" will first be displayed in the status line of the RPG Control/Status window. As the RPG is restarted, numerous messages will be written to the RPG system status log and displayed in the status line while in the TRANSITION state. When the state becomes OPERATE, the message "RPG State: OPERATE" will be displayed. If the startup command is not successful, the message "RPG Startup Command Failed" is displayed in the feedback line of the RPG Control/Status window.

Clicking No will close the warning_popup window and do nothing.

2.3.13.1.2.2 RPG Restart - Options. Selecting the Options button brings up the RPG Init Options Window. This window contains a set of selections to initialize various RPG components at specific RPG states. See [Figure 2-43](#). Click on the Close button to close the RPG Init Options window and return the user to the RPG Control window.

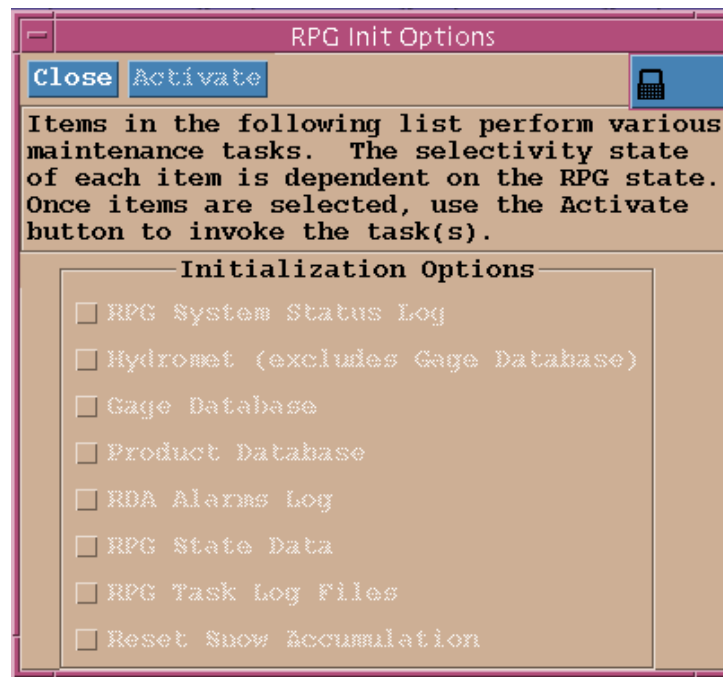


Figure 2-43. RPG Init Options

2.3.13.1.2.2.1 Activate Button. The Activate button is only sensitized when the window is unlocked. To open the Initialization Options for selection, follow the procedures described in paragraph 2.2.4.1.7.

Click the Activate button and a warning_popup appears that states: "You are about to initialize all of the data selected in the Initialization Options list. Do you want to continue?".

Click Yes to invoke the initialization task associated with each item selected in the "Initialization Options" list. Most initialization tasks generate a system log message which is displayed in the status line of the RPG Control/Status window.

Click No to close the warning_popup window only and leave the user at the RPG Init Options window.

2.3.13.1.2.2.2 Initialization Options. Within the Initialization Options section is a list of initialization tasks which are only selectable when the window is unlocked and the RPG is in a pre-defined state. Currently, both the Hydromet and Snow Accumulation tasks are selectable for initialization when the RPG is running. All other tasks require that the system be in a SHUT-DOWN state.

- RPG System Status Log: - This task deletes all messages from the RPG system status log file.
- Hydromet: - This option initializes the hydromet database; exclud-

ing the rain gage database.

- Gage Database: - This option initializes the rain gage database only.
 - Product Database: - This option deletes all products from the RPG products database.
 - RDA Alarms Log: - This option deletes all RDA alarm messages in the RDA alarms log file but does not delete RDA alarm messages from the system status log file.
 - RPG State Data: - This option initializes RPG state data.
 - RPG Task Log Files: - Clicking on this option causes the task log files to be cleared out when the RPG is restarted. Otherwise the log files remain intact.
- |
- Reset Snow Accumulation- This option resets the snow accumulation to zero.

2.3.13.1.2.3 **RPG Shutdown.** Clicking the Off button brings up a warning_popup which states: "You are about to stop all of the RPG processes. Do you want to continue?".

Click Yes to send a shutdown command to the RPG manager. If the shutdown command is accepted, the message "RPG Shutdown Command Accepted" is displayed in the feedback line of the RPG Control/Status window. The RPG state will first go to TRANSITION, and then to SHUTDOWN. The message "RPG operability Status: COMMANDED SHUTDOWN" will be written to the RPG system status log and displayed in the status line of the RPG Control/Status window. If the shutdown command is not accepted, the message "RPG Shutdown Command Failed" is displayed in the feedback line of the RPG Control/Status window.

Click No to close the warning_popup window and do nothing.

The Off button is sensitized when the RPG state is OPERATE or STANDBY. Otherwise, it is desensitized.

NOTE

When starting the RPG from a SHUTDOWN state, full initialization is done. If full initialization is not desired, first put the RPG state in STANDBY before starting it up.

2.3.13.1.2.4 **RPG Shutdown - Standby.** Click the Standby button brings up a warning_popup which states: "You are about to stop all of the RPG processes. Do you want to continue?".

Click Yes to send a standby command to the RPG manager. If the standby command is accepted, the message "RPG Standby Command Accepted" is displayed in the feedback line of the RPG Control/Status window. The RPG state will first go to TRANSITION, and then to STANDBY. The message "RPG operability Status: COMMANDED SHUTDOWN" will be written to the RPG system status log and displayed in the status line of the RPG Control/Status window. If the standby command is not accepted, the message "RPG Standby Command Failed" is displayed in the feedback line of the RPG Control/Status window.

Click No to close the warning_popup window and do nothing.

The Standby button is sensitized when the RPG state is in OPERATE or SHUTDOWN. Otherwise, it is grayed-out and desensitized.

NOTE

When starting the RPG from a STANDBY state, no initialization is done. If the user wants initialization to happen, first put the RPG state in SHUTDOWN before starting it up.

2.3.13.1.2.5 RPG Mode - Operate. Click on the RPG Mode Operate button and a warning_popup appears that states: "You are about to change to Operate mode. Do you want to continue?".

Click Yes to send an operate command to the RPG manager. If the operate command is accepted, the message "RPG Commanded to Operate" is displayed in the feedback line of the RPG Control/Status window. The message "RPG State: OPERATE" will be written to the RPG system status log and displayed in the status line of the RPG Control/Status window. The Mode: label at the top of the RPG Control window will change to OPERATE.

Click No to close the warning_popup and do nothing.

The Operate button is grayed-out and desensitized when the RPG mode is OPERATE.

2.3.13.1.2.6 RPG Mode - Test. Click on the test button and a warning_popup appears that states: "You are about to change to Test mode. Do you want to continue?".

Click Yes to send a test mode command to the RPG manager. If the test mode command is accepted, the message "RPG Commanded to Test Mode" is displayed in the feedback line of the RPG Control/Status window. The message "RPG State: TEST Mode" will be written to the RPG system status log and displayed in the status line of the RPG Control/Status window. The Mode: label at the top of the RPG Control window will change to TEST (RPG).

Click No to close the warning_popup and do nothing.

The Test button is grayed-out and desensitized when the RPG mode is TEST (RPG).

NOTE

If the RPG is in test mode as a result of the RDA going to maintenance mode (TEST (RDA)), it is possible to prevent the RPG from going back to operate mode when the RDA goes to operate by clicking the Test button.

2.3.13.1.3 Default Weather Mode. The Default Weather Mode has two selections: Clear Air (B) or Precipitation (A). This parameter is password protected at the URC or ROC LOCA. Enter in

the correct password, and the Default Weather Mode can be toggled between the two options. This defines the mode that the RPG will return to when it has been restarted or turned on.

2.3.13.1.4 Default VCP Mode. This is the Precipitation Default VCP that the RPG will operate in when restarted or turned on. It can only be changed with the ROC LOCA. The default value is VCP 21. The Current: block highlights which VCP Mode A is selected.

2.3.13.1.5 Default VCP Mode B. This is the Clear Air Default VCP that the RPG will operate in when restarted or turned on. It can only be changed with the ROC LOCA. The default value is VCP 32. The Current: block highlights which VCP Mode B is selected.

2.3.13.2 RPG Products Window. Click on the Products button in the RPG icon. An RPG Products window will open. The RPG Products window has two subsets. See [Figure 2-44](#). The first is Adaptation Data with five separate windows, and the second is Display with one separate window.

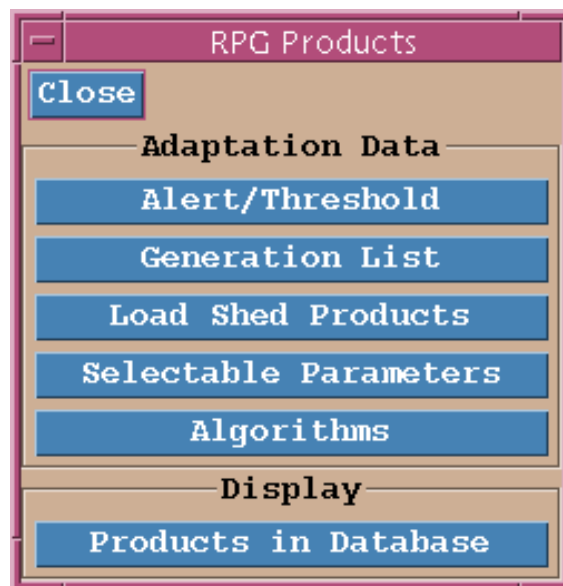


Figure 2-44. RPG Products

2.3.13.2.1 Adaptation Data. There are five subsets of Adaptation Data for the RPG. These are Alert/Threshold, Generation List, Load Shed Products, Selectable Parameters, and Algorithms. The five subsets are described in detail in the following paragraphs.

2.3.13.2.1.1 Alert/Threshold. Click on the “Alert/Threshold” button and the Alert Threshold Editor window opens. See [Figure 2-45](#). The top line has five buttons, the three Group types (Grid Products, Volume Products, and Forecast Products) and the padlock password block. The first button, Close, closes the window and returns the user to the RPG Products window. The other four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially grayed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline:

Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized. See the important note later in this paragraph pertaining to baseline restoral “limitations”. To view the complete right hand side border of the window, use the horizontal scroll bar along the bottom of the window. The user can click and drag on the bar, or click the arrows to move right or left along the window.

Alert Threshold Editor

Close
Save
Undo

Baseline:
Restore
Update

Group:
☒ Grid
 ☐ Volume
 ☐ Forecast

Category	Units	Min	Max	Th1	Th2	Th3	Th4	Th5	Th6	Paired Product
Velocity	kts	0	246	15	25	35	45	50	60	[44] - SWV Severe Weather (Velo
Composite Refl	dBZ	-32	95	20	30	40	50	60	70	[38] - CR Composite Reflectivit
Echo Tops	kft	0	70	30	40	50	60			[41] - ET Echo Tops: 16 level/2
SVR wx Prob	%	0	100	30	40	50	60	70		[47] - SWP Severe Weather Proba
VIL	kg/m2	0	80	35	40	45	50	55	65	[57] - VIL Vertically Integrate

Figure 2-45. Alert Threshold Editor

To view the three groupings, click on the button to the left of each title (or on the title itself). The button turns to white and the table is refreshed with the categories of each group. Each group's window contains the product Category, Units, Minimum and Maximum values allowed, six threshold categories, and the Paired Product. The Grid Products category consists of Velocity, Composite Reflectivity, Echo Tops, Severe Weather Probability, and Vertically Intergrated Liquid (VIL). The Volume Products group includes Velocity Azimuth Display (VAD), Maximum Hail Size, Mesocyclone, Tornado Vortex Signature (TVS), Maximum Storm Reflectivity, Probability of Hail, Probability of Severe Hail, Storm Top, and Maximum 1 Hour Precipitation. The Forecast Products group lists Maximum Hail Size, Mesocyclone, TVS, Maximum Storm Reflectivity, Probability of Hail, Probability of Severe Hail, and Storm Top.

To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#).

To modify the six threshold values, move the cursor to the desired spot and click (or use the tab key to move the red outline to the desire spot). Using the number keys, enter the appropriate value. Then move the cursor to another location and click. If the value is within the range allowed for that box, it will be temporarily accepted while the operator edits another box. If the value is not within the range allowed, a warning_popup will appear that states: "You entered an invalid value of XXX. The valid range is AA to BB." (XXX is the value just entered, AA is the lowest value the user can enter, BB is the highest value the user can enter.) Click on the Continue button, the original value of the box will be restored, and the user is returned to the same area in the Alert Threshold Editor window.

To change the Paired Product, move the cursor to the existing paired product title and click. A new window opens with the available products from which to select. Select the new paired product by moving the cursor to the new title and click. The new selection will show up in the Paired Product column and the user is returned to the Alert Threshold Editor window automatically. Repeat this process for any other changes in the Paired Product column.

Once the desired changes have been made for that window, move the cursor to the top line of the window. The Close, Save, and Undo buttons are sensitized and functional.

Clicking on the Close button first will bring up a warning_popup that states: "You modified the alert threshold data but did not save your changes. Do you want to save your changes?" Click on Yes or No. If Yes, the changes are saved and the user returned to the RPG Products window. If No, the changes are not saved and the user returned to the HCI.

The Save button will allow the user to save the changes that were just made. Click on the Save button and a warning_popup opens that states: "You are about to overwrite the alert threshold data. Do you want to continue?" Click on either Yes or No. If Yes, the changes are saved, the Save button becomes grayed-out and desensitized, the password protected fields are closed, and the user is returned to the Alert Threshold Editor. If No, the changes are still on the window, the Save button is still sensitized, the password protected fields are still open, and the user remains in the Alert Threshold Editor window. Clicking on the Close button now will close the Editor and return the user to the RPG Products window with no other warning_popup windows.

The Undo button undoes any changes that had been made since the last Save. There is no warning_popup as the changes are deleted, the Undo button becomes grayed-out and desensitized, the password protected fields are closed, and the user is back to the Alert Threshold Editor window. Clicking on the Close button now will close the Editor and return the user to the RPG Products window with no other warning_popup windows.

Once the Save and Undo buttons are grayed-out and desensitized, the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator. The Restore and Update buttons both apply to the baseline values.

NOTE

When the Baseline: Restore button is selected and a “Yes” choice is made, ALL three groups (Grid, Volume, Forecast) will be restored to baseline values, not just the one group just modified. Sites should keep hard copies of these three windows (Grid, Volume, Forecast) in order to recreate the site-desired values on these windows.

Click on the Restore button and a warning_popup opens that states: “You are about to restore the alert/threshold adaptation data to baseline values. Do you want to continue?” Click on either Yes or No. The appropriate actions are made and the user is returned to the Alert Threshold Editor window. Click on the Update button and a warning_popup opens that states: “You are about to replace the alert/threshold adaptation data values. Do you want to continue?” Click on either Yes or No. The appropriate actions are taken and the user is returned to the Alert Threshold Editor window.

2.3.13.2.1.2 Generation List. Click on the Generation List button, and the RPG Product Generation Table Editor window opens. See [Figure 2-46](#). The top line contains three control buttons (Close, Save, and Undo) followed by the choice of four tables.

RPG Product Generation Table Editor

Table: ☒ Current ☐ Precip (A) ☐ Clear Air (B) ☐ Maintenance

Replace Current Table with: ☐ Precip Mode (A) ☐ Clear Air Mode (B) ☐ Maintenance Mode

Search: Sort by: ☒ Product Code ☐ Product MNE ☐ Description

MNE	Code	Gen	Sto	(mins)	Elev/Cut(s)	Product Description
R	16	0	0	0	<= 0	Base Reflectivity: 8 level/0.54 nm
R	17	0	0	0	<= 0	Base Reflectivity: 8 level/1.1 nm
R	18	1	1	180	<= -1	Base Reflectivity: 8 level/2.2 nm
R	19	1	1	180	<= -4	Base Reflectivity: 16 level/0.54 nm
R	20	1	1	180	<= -3	Base Reflectivity: 16 level/1.1 nm
R	21	0	0	0	<= 0	Base Reflectivity: 16 level/2.2 nm
V	22	0	0	0	<= 0	Base Velocity: 8 level/0.13 nm
V	23	0	0	0	<= 0	Base Velocity: 8 level/0.27 nm
V	24	1	1	180	<= -1	Base Velocity: 8 level/0.54 nm
V	25	1	1	180	<= -1	Base Velocity: 16 level/0.13 nm
V	26	1	1	180	<= -3	Base Velocity: 16 level/0.27 nm
V	27	1	1	180	<= -4	Base Velocity: 16 level/0.54 nm
SW	28	1	1	180	<= -1	Base Spectrum Width: 8 level/0.13 nm
SW	29	1	1	180	<= -3	Base Spectrum Width: 8 level/0.27 nm
SW	30	1	1	180	<= -4	Base Spectrum Width: 8 level/0.54 nm
USP	31	1	1	180	<=	User Selectable Storm Total Precipitation: 16 level/1.1 nm
DHR	32	1	1	60	<=	Digital Hybrid Scan Reflectivity: 256 level/0.54 nm
HSR	33	1	1	180	<=	Scan Reflectivity: 16 level/0.54 nm
CFC	34	1	1	360	<=	Clutter Filter Control: 8 level/0.54 nm

This product has no extra parameters

Figure 2-46. RPG Product Generation Table Editor

The Close button (if no changes have been made) closes the Editor window and returns the user to the RPG Products window. If changes have been made and not saved, a warning_popup opens that states: “Do you want to save changes to the current generation table?” Click on either Yes or No. The user is then returned to the HCI. The Save and Undo buttons are initially grayed-out and desensitized until changes are made in any of the generation lists. (They are described later in this section.)

The four generation tables to choose from are: Current, Precip (A), Clear Air (B), and Maintenance. Move the cursor to the button left of the table title (or to the title itself) of the desired category, then click. The button will turn white and the appropriate generation table will open. If any other table besides Current is selected, there are several changes to the window. See [Figure 2-47](#). The Current table is not password protected. However, the other three tables are editable only at the ROC LOCA. To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#). In addition, the second line of the window, once unlocked, changes to become the control buttons for the Baseline: Restore and Baseline: Update functionality.

NOTE

Once changes are made to any of the generation tables and saved, the changes will take effect at the start of the next volume scan. There is no need to shut down and restart the RPG for the changes to be incorporated because the tables are polled at the start of each volume scan automatically.

The second line changes to Baseline: Restore and Update. The third line Sort by: category of Product MNE becomes Product ID. A new column is added as the first column and is labeled PrID, for Product ID. Also, the entire window is now password protected, and a closed padlock block opens in the upper right corner.

Initially, the second line provides the user with options to replace the current generation table. The title is “Replace Current Table with:” followed by the options Precip Mode (A), Clear Air Mode (B), and Maintenance Mode. Click on the button left of the titles (or the titles themselves) and a warning_popup opens that states: “You are about to replace the contents of the Current List with the Default Precip (A) List/Clear Air (B) List/Maintenance List. Do you want to continue?” Click on either Yes or No. If yes, the changes are made and the Save and Undo buttons are sensitized. If no, the user is returned to the Editor window. If the password protected fields have been opened for editing, the second line changes to Baseline: with the two buttons: Restore and Update.

RPG Product Generation Table Editor

☐ Current
 ☒ Precip (A)
 ☐ Clear Air (B)
 ☐ Maintenance

Baseline:

Search:
 Sort by: ☐ Product Code ☐ Product MNE ☐ Description

MNE	Code	Gen	Sto	(mins)	Elev/Cut(s)	Product Description
R	16	0	0	0	0	Base Reflectivity: 8 level/0.54 mm
R	17	0	0	0	0	Base Reflectivity: 8 level/1.1 mm
R	18	0	0	0	0	Base Reflectivity: 8 level/2.2 mm
R	19	1	1	180	-4	Base Reflectivity: 16 level/0.54 mm
R	20	1	1	180	-3	Base Reflectivity: 16 level/1.1 mm
R	21	0	0	0	0	Base Reflectivity: 16 level/2.2 mm
V	22	0	0	0	0	Base Velocity: 8 level/0.13 mm
V	23	0	0	0	0	Base Velocity: 8 level/0.27 mm
V	24	1	1	180	-1	Base Velocity: 8 level/0.54 mm
V	25	1	1	180	-1	Base Velocity: 16 level/0.13 mm
V	26	0	0	0	0	Base Velocity: 16 level/0.27 mm
V	27	1	1	180	-4	Base Velocity: 16 level/0.54 mm
SW	28	1	1	180	-1	Base Spectrum Width: 8 level/0.13 mm
SW	29	0	0	0	0	Base Spectrum Width: 8 level/0.27 mm
SW	30	1	1	180	-4	Base Spectrum Width: 8 level/0.54 mm
USP	31	1	1	180	0	User Selectable Storm Total Precipitation: 16 level/1.1 mm
DHR	32	1	1	60	0	Digital Hybrid Scan Reflectivity: 256 level/0.54 mm
HSR	33	1	1	180	0	Scan Reflectivity: 16 level/0.54 mm
CFC	34	1	1	360	0	Clutter Filter Control: 8 level/0.54 mm

This product has no extra parameters

Figure 2-47. RPG Product Generation Table Editor - Password Protected

The four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially grayed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized. Clicking on the Restore button brings up a warning_popup that states: “You are about to replace the Precip (A) table/Clear Air (B) table/ Maintenance table with baseline values. Do you want to continue?” Click on either Yes or No. Clicking on the Update button brings up a warning_popup that states: “You are about to replace the baseline Precip (A) table/Clear Air (B) table/Maintenance table with new values. Do you want to continue?” Click on either Yes or No.

The third line provides the user a Search and a Sort capability. To search, move the cursor to the box just right of the title “Search:” and click. Then, using the alphanumeric keyboard, type in the word/phrase/letters that will be used to search and press the Return key. The search goes through the Product Title column and lists all the products that have the same text string of characters. In order to restore the full list of products, the user must delete the text string in the search box and press the Return key. To the right of the search block is the sort capability with three options: Product Code, Product Mnemonic (MNE), or Description. Click on the button to the left of the sort description or on the title itself. The button will turn white and the table below will be resorted accordingly. The Product Code sorts the products in numerical sequence. The Product MNE sorts the products alphabetically by mnemonics. The Description sorts the products in alphabetical order based on the product description. If editing one of the password protected tables, the Sort by: option changes from Product MNE to Product ID. Clicking on the button to Sort by Product ID performs a numerical sort of all the products by the first column, PrID, and refreshes the table with the new listing.

Columns of data that are not editable are the Product ID (with password protected tables), Product MNE, Product Code, and Product Description.

The four columns of data that can be edited are described in [Table 2-3](#) below with their edit options.

Table 2-3. Product Generation Table - Editable Parameters

Parameter	Options
Generation (Gen)	Options are 0 or 1. Enter in a 0 to have the product not generated. Enter in a 1 to have the product generated.
Storage (Sto)	Options are 0 or 1. Enter in a 0 to have the product not stored. Enter in a 1 to have the product stored.
Minutes (mins)	Range is 30 to 360. This is the range in minutes that the product will be stored in the database. The Sto value in the previous column must be set at 1 in order to have this storage time go into effect.

Table 2-3. Product Generation Table - Editable Parameters (Continued)

Parameter	Options
Elevation/Cut(s) (Elev/Cut(s))	<p>If the product is not selected for generation, the Elevation blue box will be grayed out and desensitized, and the block cannot be checked. The "<=" symbols will also be grayed out. There will be no value in the Cut column.</p> <p>Once the product has been selected for generation, the default value in the Cut column will be automatically entered. This value can be changed by the operator. The range of values have two sets of limits and represents two different options:</p> <ul style="list-style-type: none"> • Lowest Number of Elevation Cuts: -1 to -20 (Integer) • Specific Elevation Cuts: -1.0 to 45.0 (Decimal to the tenths) <p>To select the generic lowest number of elevation cuts, enter a value in the range of -1 to -20. The negative integer number represents the number of cuts starting from the lowest elevation slice to be generated. Example: -4 would be the four lowest elevation slices to be generated.</p> <p>To select a specific elevation cut, enter a value of -1.0 to 45.0. Note that this is a decimal to the tenth's digit. This entry does two things: It is matched up with the closest elevation slice and generates that slice. It also sensitizes the Elevation blue block with the <= sign.</p> <ul style="list-style-type: none"> • If the Elevation blue block is NOT CHECKED, the decimal number (to the tenth's digit) represents the single elevation angle closest to that number that will be generated. • If the Elevation blue block is CHECKED, the decimal number (to the tenth's digit) indicates that ALL elevations from that elevation down to the lowest possible elevation slice will be generated <p>With the current VCPs (Build 5.0), the lowest possible elevation angle is 0.5. If the operator enters in any value from -1.0 to 0.5, the elevation slice selected will be 0.5. If future VCPs have negative elevation slices, then this option will select those slices.</p> <p>Once a product has been deleted from being selected for generation, the Elevation blue box will be empty and the "<=" symbols will be grayed out and desensitized. The Cuts column will be blank.</p> <p>If a valid Cut value is entered (either integer or decimal) for a product that has not yet been selected for generation, the "Gen" number is automatically changed to 1 and the product selected for generation.</p>

If a product has additional parameters that are editable, a secondary window will appear at the bottom of the table once the product has been clicked. Move the cursor to those fields and edit according to the limits that are listed with each parameter.

If invalid entries are made in any of the edit fields, warning_popups will appear that describe the invalid value, display the valid range, or explain the proper correlation between various columns that must exist. Click on the Continue box of the warning_popup to return to the RPG Product Generation Table Editor window.

Once the desired changes have been made for that window, move the cursor to the top line of the window. There are three buttons that are now sensitized: Close, Save, and Undo.

If the user is in the Current Generation list, clicking on the Close button first will bring up a warning_popup that states: "Did you want to save changes to the current generation table?" Click on either Yes or No. The user is then returned to the RPG Products window. Clicking on the Save button will bring up the same warning_popup; the user remains at the Editor window and both the Save and Undo buttons are grayed-out and desensitized. Clicking on the Undo button removes the changes, grays-out and desensitizes the Save and Undo buttons, and leaves the user at the Editor window. Once the Save and Undo buttons are grayed-out and desensitized, the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator. Clicking on the Close button now will close the Editor and return the user to the RPG Products window with no other warning_popup windows.

If the user is in the Precip, Clear Air, or Maintenance table, clicking on the Close button first will bring up a warning_popup that states: "Do you want to save changes to the Precip Mode (A) / Clear Air Mode/Maintenance Mode generation table?" Click on either Yes or No. The Editor is closed and the user is returned to the HCI. Clicking on the Save button will bring up the same warning_popup, but the user remains at the Editor window. The Save and Undo buttons are grayed-out and desensitized and the password protected fields are left open. When changes are made to the editable fields and the Return key pressed or another block clicked, the Save and Undo buttons become sensitized. Clicking on the Save button brings up a warning_popup that states: "Do you want to save changes to the Precip (A)/Clear Air (B)/Maintenance table?" Click on either Yes or No. The changes are either saved or not, and the user returned to the editor field with both the Save and Undo buttons still sensitized and the password protected fields are left open. Clicking on the Undo button removes the changes, grays-out and desensitizes the Save and Undo buttons, leaves the user at the Editor window, and leaves the password protected fields open. The Baseline: Restore and Baseline: Update buttons become sensitized initially when the password has been successfully entered. This provides the user with the opportunity to restore or update previously entered data. Clicking on the Restore button will bring up a warning_popup that states: "You are about to replace the Precip (A)/Clear Air (B)/Maintenance table with baseline values. Do you want to continue?" Click on either Yes or No. Clicking on the Update button will bring up a warning_popup that states: "You are about to replace the baseline Precip (A)/Clear Air (B)/Maintenance table with new values. Do you want to continue?" Click on either Yes or No. Once data has been entered in any of these three tables, the Restore and Update buttons become grayed-out and desensitized until the changes have been saved. Once the changes have been saved, then the Save and Undo buttons are grayed-out and desensitized and the Baseline:

Restore and Baseline: Update buttons become sensitized and function the same as described earlier in this paragraph. Once the Save and Undo buttons are grayed-out and desensitized, the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator. Clicking on the Close button now will close the Editor and return the user to the RPG Products window with no other warning_popup windows.

2.3.13.2.1.3 Load Shed Products. Click on the block “Load Shed Products” and the RPG Product Priority (Load Shed Products) window opens. See [Figure 2-48](#). The top line has five buttons and the password protection padlock. The first button, Close, closes the window and returns the user to the RPG Products window if there have been no changes made. The next four buttons: Save, Undo, and Baseline: Restore, and Update are grayed-out and desensitized until the password is entered. To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#). When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized.

RPG Product Priority (Load Shed Products)

Close Save Undo Baseline: Restore Update

Search: Sort by: ☐ Product Code ☐ Product MNE ☐ Description

MNE	Code	Mode A	Mode B	Mode M	Product Description
R	16	56	56	56	Base Reflectivity: 8 level/0.54 nm
R	17	55	55	55	Base Reflectivity: 8 level/1.1 nm
R	18	54	54	54	Base Reflectivity: 8 level/2.2 nm
R	19	89	89	89	Base Reflectivity: 16 level/0.54 nm
R	20	88	88	88	Base Reflectivity: 16 level/1.1 nm
R	21	87	87	87	Base Reflectivity: 16 level/2.2 nm
V	22	53	53	53	Base Velocity: 8 level/0.13 nm
V	23	52	52	52	Base Velocity: 8 level/0.27 nm
V	24	51	51	51	Base Velocity: 8 level/0.54 nm
V	25	86	86	86	Base Velocity: 16 level/0.13 nm
V	26	85	85	85	Base Velocity: 16 level/0.27 nm
V	27	84	84	84	Base Velocity: 16 level/0.54 nm
SW	28	60	60	60	Base Spectrum Width: 8 level/0.13 nm
SW	29	59	59	59	Base Spectrum Width: 8 level/0.27 nm
SW	30	58	58	58	Base Spectrum Width: 8 level/0.54 nm
USP	31	57	57	57	User selectable Storm Total Precipitation: 16 level/1.1 nm

Figure 2-48. RPG Product Priority (Load Shed Products)

The second line contains a Search Block and three Sort by categories: Product Code, Product MNE, or Description. To perform a search, move the cursor to the box just to the right of the title “Search:” and click. Then, using the alphanumeric keyboard, type in the text string (word, phrase, letters, or numbers) that will be used to search through the Product Description and press the Return key. The table below the Search block will then refresh with only the products that match the search. In order to return back to the full listing, delete the text string and press the Return key. To the right of the search block is the Sort by: capability with three options: Product Code, Product MNE, or Description. Click on the button to the left of the sort description or on the title itself. The button will turn white and the table below will be resorted accordingly. The Product Code sorts the products in alphabetical order. The Product MNE sorts the products in numerical sequence. The Description sorts the products in alphabetical order based on the product description.

The table initially contains the following information: Product MNE, Product Code, Mode A, Mode B, Mode M, and Product Description. Once the password protected blocks have been opened, the Product MNE column turns to Product ID, the Sort by: Product MNE turns to Sort by: Product ID, and the rank ordering of the products for each mode can now be changed. Once the password has been successfully entered, the first column of information changes from Product MNE to Product ID and the search option changes from Product MNE to Product ID. Once the password protected blocks have been opened, the rank ordering of the products for each mode can be changed. The valid range for making changes is from 0 to 254. The higher the number, the higher the priority. Click on the desired block, enter the new desired number, and then click in another block, press the Return key, click on any control button. If the number is accepted, there will be no warning_popup window. If the number exceeds the range, then a warning_popup opens that states: “An invalid priority of XXXXX was entered. The valid range is 0 to 254.” XXXXX is the invalid entry. Click on the Continue button and the invalid entry will be deleted, the former value restored, and the user returned to the area to attempt another change.

To scroll through the table, use the vertical scroll bar along the right hand margin. To display more text on a particular line, use the horizontal scroll bar along the bottom of the window.

Once any desired changes have been made, the Close, Save, and Undo buttons are sensitized and functional. The Baseline: Restore and Baseline: Update buttons have been grayed-out and desensitized. If the user clicks on the Close button at this time, a warning_popup opens that states: “Do you want to save changes you made to the priority table?” Click on either Yes or No. If Yes, the changes are saved and the user returned to the HCI. If No, the user will be returned to the HCI without any changes being saved.

Clicking on the Save button will bring up a warning_popup that states: “Do you want to save changes you made to the priority table?” Click on either Yes or No. If Yes, the changes will be saved, the user returned to the RPG Product Priority window, and the Save and Undo buttons are grayed-out and desensitized. Clicking on the Close button now closes the window and returns the user to the RPG Products window with no warning_popup. If No, the changes are not saved and the user returned to the RPG Product Priority window, but the edited changes are still in the table. Clicking on the Close button calls up a warning_popup window that states: “Do you want to save

changes you made to the priority table?” Click Yes or No. The changes are saved or not, depending on the user’s response, and the user is returned to the RPG Products window.

Click on the Undo button to delete all the changes that have been made, restore the previous values, grayed-out and desensitize the Save and Undo buttons, and remain at the RPG Product Priority window. Clicking on the Close button now closes the window and returns the user to the RPG Products window with no warning_popup.

Once the Save and Undo buttons are grayed-out and desensitized, the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator. Click on the Baseline: Restore button to restore all values back to the baseline values. A warning_popup opens that states: “You are about to restore the product priority adaptation data to baseline values. Do you want to continue?” Click on either Yes or No. If Yes, the values are restored to the baseline values. If No, then no changes are made and the user returns to the RPG Product Priority window.

Click on the Baseline: Update button to change the baseline values to include the changes that were just been made. A warning_popup opens that states: “You are about to replace the baseline product priority adaptation data values. Do you want to continue?” Click on either Yes or No. If Yes, the baseline values are changed and the user returns to the RPG Product Priority window. If No, then no changes are made and the user returns to the RPG Product Priority window.

2.3.13.2.1.4 Selectable Parameters. Click on the “Selectable Parameters” button in the RPG icon, and the Edit Selectable Product Parameters window opens. See [Figure 2-49](#). The top line has five buttons and the padlock for the password protected entries. The first button, Close, closes the window and returns the user to the RPG Products window. The four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially grayed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized.

☐ Cell Product
 ☐ Layer Product
 ☐ OHP/THP Data Levels

Category:
 ☐ RCM Product
 ☐ RCM Reflectivity Data Levels
 ☐ STP Data Levels

☐ VAD and RCM Heights
 ☐ Velocity Data Levels

Cell Product Parameters

Parameter Name	Minimum	Maximum	Current	Units
Max # Cells - STI Alphanumeric Product	7	100	34	storm cells
Max # Cells - SS Alphanumeric Product	10	100	40	storm cells
Max # Cells - Hail Alphanumeric Product	10	100	40	storm cells
Max # Cells - STI Attribute Table	6	100	36	storm cells
Max # Cells - Combined Attribute Table	4	100	32	storm cells
Max # Cells - Hail Attribute Table	6	100	36	storm cells

Figure 2-49. Edit Selectable Product Parameters

The second block contains the nine categories of parameters that can be viewed as is or edited once the password has been accepted. These categories are: Contour Products, One Hour Precipitation (OHP)/Three Hour Precipitation (THP) Data Level, Storm Total Precipitation (STP) Data Levels, Cell Product, Radar Coded Message (RCM) Product, VAD and RCM Heights, Layer Product, RCM Reflectivity Data Levels, and Velocity Data Levels. To view the parameters, click on the button to the left of each title (or on the title itself), the button turns to white, and the table below this block is refreshed with the appropriate parameters.

To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#).

To modify the various parameters, move the cursor to the desired spot and click. Using the numeric keyboard, enter in the appropriate value. Then move the cursor to another location and click. If the value is within the range allowed for that box, it will be temporarily accepted while the operator edits another box. If the value is not within the range allowed, a warning_popup will appear that states: “XXX is not valid, numeric value must be between AA and BB.” (XXX is the value just entered, AA is the lowest acceptable value and BB is the highest acceptable value.) Click on the Continue button, the original value of the box will be restored, and the user is returned to the same area in the Edit Selectable Product Parameters window.

Once any desired changes have been made, the Close, Save, and Undo buttons are now sensitized and functional. The Baseline: Restore and Baseline: Update buttons have been grayed-out and desensitized. If the user clicks on the Close button at this time, a warning_popup opens that states: “You modified selectable parameters but did not save your changes. Do you want to save your changes?” Click on either Yes or No. If Yes, the changes are saved and the user returned to the HCI. If No, the changes are not saved and the user returned to the HCI.

Clicking on the Save button after allowable changes have been made will bring up a warning_popup that states: “Do you want to save your changes?” Click on either Yes or No. If Yes, the changes will be saved, the user returned to the Edit Selectable Product Parameters window, and the Save and Undo buttons are grayed-out and desensitized. Clicking on the Close button now closes the window and returns the user to the RPG Products window with no warning_popup. If No, the changes are not saved and the user is returned to the Edit Selectable Product Parameters window, but the edited changes are still in the table. Clicking on the Close button calls up a warning_popup window that states: “You modified selectable parameters but did not save your changes. Do you want to save your changes?” Click on either Yes or No. If Yes, the changes will be saved and the user returned to the HCI. If No, the changes are not saved and the user returned to the HCI.

Click on the Undo button to delete all the changes that have been made, restore the previous values, grayed-out and desensitize the Save and Undo buttons, and remain at the Edit Selectable Product Parameters window. Clicking on the Close button now closes the window and returns the user to the RPG Products window with no warning_popup.

Click on the Baseline: Restore button to restore all values on that window back to the baseline values. A warning_popup opens that states: “You are about to restore the product parameters

adaptation data to baseline values. Do you want to continue?” Click on either Yes or No. If Yes, the values are restored to the baseline values and the user returned to the Edit Selectable Product Parameters window. If No, then no changes are made and the user returned to the Edit Selectable Product Parameters window.

Once the Save and Undo buttons are grayed-out and desensitized, the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator. Click on the Baseline: Update button to change the baseline values with the changes that have been just made. A warning_popup opens that states: “You are about to replace the baseline product parameters adaptation data values. Do you want to continue?” Click on either Yes or No. If Yes, the baseline values are changed and the user returned to the Edit Selectable Product Parameters window. If No, then no changes are made and the user returned to the Edit Selectable Product Parameters window.

Each of the eight categories are now discussed in detail.

2.3.13.2.1.4.1 Cell Product Parameters. Click on the button or the Cell Product title. The button will turn white and the Cell Product window opens. See [Figure 2-50](#). Using the password procedures, open the edit fields. There are six values that can be modified on this window. They are the Max Cells in the STI, SS, and Hail Alphanumeric products and the Max Cells in the STI, Combined, and Hail Attribute Tables. Click the cursor in the highlighted blocks for the parameters that are to be changed. Using the keyboard, enter the desired numerical value. The allowable ranges are just to the left under the Minimum and Maximum columns. Under the Current column, up to eight digits can be entered. Once the desired value has been entered, click to the next entry. If the value is within the allowable range, then the user can continue with the next entry. If the value is outside the allowable range, a warning_popup opens that states: “DDD is out of range, must be in the range AA <= X <= BB” where DDD is the value just entered, AA is the Minimum value, X is the allowable value, and BB is the Maximum value. Click on the Continue button and the user will be returned to the previous window. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, and Baseline: Restore or Update the parameters.

Edit Selectable Product Parameters

Baseline:

Category:
 ☒ Cell Product
 ☐ Layer Product
 ☐ OHP/THP Data Levels
☐ RCM Product
 ☐ RCM Reflectivity Data Levels
 ☐ STP Data Levels
☐ VAD and RCM Heights
 ☐ Velocity Data Levels

Cell Product Parameters			
Parameter Name	Minimum	Maximum	Current
Max # Cells - STI Alphanumeric Product	7	100	34
Max # Cells - SS Alphanumeric Product	10	100	40
Max # Cells - Hail Alphanumeric Product	10	100	40
Max # Cells - STI Attribute Table	6	100	36
Max # Cells - Combined Attribute Table	4	100	32
Max # Cells - Hail Attribute Table	6	100	36

Units
storm cells
storm cells
storm cells
storm cells
storm cells
storm cells

Figure 2-50. Cell Product Parameters

2.3.13.2.1.4.2 RCM Product Parameters. Click on the button or the RCM Product title. The button will turn white and the RCM Product Parameters window opens. See [Figure 2-51](#). Using the password procedures described earlier, open the edit fields. There are seven values that can be modified. These are Range Threshold, Centroid Count, Edit Decision Time, Edit Time-Out, Product Generation Time 1, and Product Generation Time 2. Click the cursor onto the highlighted blocks for the parameters that are to be changed. Using the keyboard, enter in the desired numerical value. The allowable ranges are just to the left under the Minimum and Maximum columns. Under the Current column, up to eight digits can be entered. Once the desired figure has been entered, click to the next entry. If the figure is within the allowable range, then the user can continue with the next entry. If the figure is outside the allowable range, a warning_popup opens that states: “DDD is out of range, must be in the range AA <= X <= BB” where DDD is the value just entered, AA is the Minimum value, X is the allowable value, and BB is the Maximum value. Click on the Continue button and the user will be returned to the previous window. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore, or Baseline: Update the parameters.

On the bottom of this window are three check blocks that act as toggles (on and off). These are Restrict Class IV, Generation Time 1, and Generation Time 2. Click on the square box or the title itself to toggle this value on or off. When the block is white with a black check mark, it is activated. When it is the background color with no check mark, it is not activated. The Restrict Class IV switch, when on, restricts the distribution of the unedited RCM messages from the RPG to the Class IV users. The Generation Time 1, when on, activates the sending of the RCM product at the specific time identified in the table above. The Generation Time 2, when on, activates the sending of the RCM product at the specific time identified in the table above. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore, or Baseline: Update the parameters.

Close

Save

Undo

Baseline:

Restore

Update

☐ Cell Product

☒ RCM Product

☐ VAD and RCM Heights

Category:

☐ Layer Product

☐ RCM Reflectivity Data Levels

☐ Velocity Data Levels

☐ OHP/THP Data Levels

☐ STP Data Levels

RCM Product Parameters

Parameter Name	Minimum	Maximum	Current	Units
Range Threshold	-33.0	94.0	20.0	dBZ
Centroid Count	0	20	12	

Figure 2-51. RCM Product Parameters

2.3.13.2.1.4.3 VAD and RCM Heights Selections. Click on the button or the VAD and RCM Heights title. The button will turn white and the VAD and RCM Heights Selections window opens. See [Figure 2-52](#). Using the password procedures described earlier, open the edit fields. Height levels are represented in thousands of feet (Kft), from 1,000 ft to 70,000 ft. For sites at elevations above 1,000 ft, the level(s) below their elevation height will be grayed-out and desensitized. Instead, using the mouse, each block under the VAD and RCM columns can be turned on or off as a toggle switch for each 1,000 ft level. Select the heights desired with the cursor and click. Up to 30 VAD height levels can be selected. Up to 19 RCM height levels can be chosen. An RCM level must be paired with a VAD height level. If an RCM height is selected that does not have the VAD height selected, the VAD height will automatically be selected, the block turns to white and the black check opens as long as the maximum numbers of VAD and RCM heights have not been exceeded. If more than 30 VAD heights are selected, a warning_popup window opens that states: “You have already reached the maximum number of VAD heights. Deselect a height and try again”. Click on the Continue button and the user will be returned to the previous window. The 31st VAD height has been deselected. If more than 19 RCM heights are selected, a warning_popup window opens that states: “You have already reached the maximum number of RCM heights. Deselect a height and try again”. Click on the Continue button and the user will be returned to the previous window. The 20th RCM height has been deselected. If an RCM height is selected that is not associated with a VAD height yet 30 VAD heights have already been selected, a warning_popup window opens that states: “You have reached the maximum number of VAD heights. RCM heights are paired with VAD heights. Deselect a heights and try again”. Click on the Continue button and the user will be returned to the previous window. The RCM height that had just been selected will be deselected. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore or Baseline: Update the parameters.

Edit Selectable Product Parameters

Close	Save	Undo	Baseline:	Restore	Update
--------------	-------------	-------------	------------------	----------------	---------------

Category:
 ☐ Cell Product
 ☐ Layer Product
 ☐ OHP/THP Data Levels
☐ RCM Product
 ☐ RCM Reflectivity Data Levels
 ☐ STP Data Levels
☒ VAD and RCM Heights
 ☐ Velocity Data Levels

									VAD and RCM Height Selections									
Level	VAD	RCM	Level	VAD	RCM	Level	VAD	RCM	Level	VAD	RCM	Level	VAD	RCM	Level	VAD	RCM	
1	<input type="checkbox"/>	<input type="checkbox"/>	11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21	<input type="checkbox"/>	<input type="checkbox"/>	31	<input type="checkbox"/>	<input type="checkbox"/>	41	<input type="checkbox"/>	<input type="checkbox"/>	51	<input type="checkbox"/>	<input type="checkbox"/>	61
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22	<input checked="" type="checkbox"/>	<input type="checkbox"/>	32	<input type="checkbox"/>	<input type="checkbox"/>	42	<input type="checkbox"/>	<input type="checkbox"/>	52	<input type="checkbox"/>	<input type="checkbox"/>	62
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	23	<input type="checkbox"/>	<input type="checkbox"/>	33	<input type="checkbox"/>	<input type="checkbox"/>	43	<input type="checkbox"/>	<input type="checkbox"/>	53	<input type="checkbox"/>	<input type="checkbox"/>	63
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	14	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	<input type="checkbox"/>	34	<input type="checkbox"/>	<input type="checkbox"/>	44	<input type="checkbox"/>	<input type="checkbox"/>	54	<input type="checkbox"/>	<input type="checkbox"/>	64
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	35	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	45	<input checked="" type="checkbox"/>	<input type="checkbox"/>	55	<input type="checkbox"/>	<input type="checkbox"/>	65
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	16	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	36	<input type="checkbox"/>	<input type="checkbox"/>	46	<input type="checkbox"/>	<input type="checkbox"/>	56	<input type="checkbox"/>	<input type="checkbox"/>	66
7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	17	<input checked="" type="checkbox"/>	<input type="checkbox"/>	27	<input type="checkbox"/>	<input type="checkbox"/>	37	<input type="checkbox"/>	<input type="checkbox"/>	47	<input type="checkbox"/>	<input type="checkbox"/>	57	<input type="checkbox"/>	<input type="checkbox"/>	67
8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	18	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	28	<input checked="" type="checkbox"/>	<input type="checkbox"/>	38	<input type="checkbox"/>	<input type="checkbox"/>	48	<input type="checkbox"/>	<input type="checkbox"/>	58	<input type="checkbox"/>	<input type="checkbox"/>	68
9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	29	<input type="checkbox"/>	<input type="checkbox"/>	39	<input type="checkbox"/>	<input type="checkbox"/>	49	<input type="checkbox"/>	<input type="checkbox"/>	59	<input type="checkbox"/>	<input type="checkbox"/>	69
10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	60	<input type="checkbox"/>	<input type="checkbox"/>	70

Height levels are represented in kft.

NOTE: Up to 30 VAD height levels may be selected. Up to 19 RCM height levels may be chosen. An RCM level must be paired with a VAD height level.

Figure 2-52. VAD and RCM Heights Selections

2.3.13.2.1.4.4 Layer Product Parameters. Click on the button or the Layer Product title. The button will turn white and the Layer Product window opens. See [Figure 2-53](#).

This window is only editable at the ROC LOCA. At the ROC LOCA, there are five values that can be modified. These are the Layer 0 Height, Layer 1 Height, Layer 2 Height, Layer 3 Height, and Range Limit. Click the cursor in the highlighted blocks for the parameter that is to be changed. Using the keyboard, enter in the desired numerical value. The allowable ranges are just to the left under the Minimum and Maximum columns. Under the Current column, up to eight digits can be entered. Once the desired value has been entered, click to the next entry. If the value is within the allowable range, then the user can continue with the next entry. If the value is outside the allowable range, a warning_popup opens that states: “DDD is out of range, must be in the range $A \leq X \leq B$ ” where DDD is the value entered, A is the Minimum value, X is the allowed value, and B is the Maximum value. Click on the Continue button, and the user will be returned to the previous window. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore, or Baseline: Update the parameters.

For the Layer 0 height: If too low a value (in Kft) is entered, a warning_popup opens that states: “The first layer height must be above the RDA elevation and 6 Kft below the next layer.” Click on the Continue button and the user is returned to the Layer Product window.

For the remainder of the layer heights: If the user enters a value that is within 6 Kft of either layer above or below, a warning_popup opens that states: “The layer height must be at least 6 Kft from the adjacent layers.” Click on the Continue button and the user is returned to the Layer Product Parameter window.

Close Save Undo Baseline: Restore Update

Edit Selectable Product Parameters

Category: ☐ Cell Product ☒ Layer Product ☐ OHP/THP Data Levels
☐ RCM Product ☐ RCM Reflectivity Data Levels ☐ STP Data Levels
☐ VAD and RCM Heights ☐ Velocity Data Levels

Layer Product Parameters

Parameter Name	Minimum	Maximum	Current	Units
Layer 0 Height	0	52	2	kft
Layer 1 Height	6	58	24	kft
Layer 2 Height	12	64	33	kft
Layer 3 Height	18	70	60	kft
Range Limit	40	460	230	km

Figure 2-53. Layer Product Parameters

2.3.13.2.1.4.5 RCM Reflectivity Data Levels. Click on the button or the RCM Reflectivity Data Levels title. The button will turn white and the RCM Reflectivity Data Levels window opens. See [Figure 2-54](#). Using the password procedures described earlier, open the edit fields. Seven values can be entered. Reflectivity Data values range from -33.0 to 95.0 dBZ. Each of the seven cut-off values are identified by a code, 1 through 7, and the values are the lower (inclusive) cutoff value. Code 1 is always No Data (ND). Codes 2 through 7 are selectable by the user. Click the cursor in the highlighted blocks for the parameter that is to be changed. Using the keyboard, enter in the desired numerical value. Under the Current column, up to five digits can be entered. Once the desired value has been entered, click to the next entry. If the value is within the allowable range, then the user can continue with the next entry. If the figure is outside the allowable range of -33 to 95, a warning_popup opens that states: “XXX is out of range, it must be in the range -33<= X<=95.” Click on the Continue button and the user will be returned to the same window. If the value is within the overall range but not within the range for that particular data code, then a different warning_popup opens that states: “XX is not valid for data code A, it must be greater than BB and less than CC.” XX is the up to five digits just entered, A is the data code being modified, BB is the value of the data code below A, and CC is the value of the data code above A.” Click on the Continue button, and the user will be returned to the previous window. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore, and Baseline: Update the parameters.

Edit Selectable Product Parameters		
Close	Save	Undo
Baseline:		
Restore	Update	
<input type="radio"/> Cell Product <input type="radio"/> Layer Product <input type="radio"/> OHP/THP Data Levels <input checked="" type="radio"/> RCM Product <input type="radio"/> RCM Reflectivity Data Levels <input type="radio"/> STP Data Levels <input type="radio"/> VAD and RCM Heights <input type="radio"/> Velocity Data Levels		
Category:		
-----INSTRUCTIONS----- Reflectivity data levels are in the range -33.0 to 95.0 dBZ. Data codes represent the lower (inclusive) cutoff value.		
RCM Reflectivity Data Levels		
Code	Current (dBZ)	
1	>=	ND
2	>	15
3	>	30
4	>	40
5	>	45
6	>	50
7	>	55

Figure 2-54. RCM Reflectivity Data Levels

2.3.13.2.1.4.6 Velocity Data Levels. Click on the button or the Velocity Data Levels title. The button will turn white and the Velocity Data Levels window opens. See [Figure 2-55](#). Using the password procedures described earlier, open the edit fields. There are eight velocity tables to select from on the left center side of the window. The default table is Precip (16/0.97). The first value, 16, represents the number of color levels, and the second value, 0.97, represents the Velocity Increment. The other seven tables can be selected by selecting the button or title line and clicking. The other seven tables are Precip (16/1.94), Precip (8/.97), Precip (8/1.94) Clear Air (16/.97), Clear Air (16/1.94), Clear Air (8/.97), and Clear Air (8/1.94). Once the table has been selected from these eight, click to the highlighted edit boxes. Using the keyboard, enter in the desired numerical value. The permissible data range is from 2 Kts to 122 Kts. Under the Current column, up to six digits can be entered. Once the desired figure has been entered, click to the next entry. If the figure is within the allowable range, then the user can continue with the next entry. If the figure is outside the allowable range of 2 to 122, a warning_popup opens that states: “XXX is out of range, it must be in the range $2 \leq X \leq 122$ ”. XXX is the value just entered. Click on the Continue button to return to the Current column. If the figure is inside the allowable range of 2 to 122 but outside the range of that respective box (higher than the previous block, lower to the following block), a warning_popup opens that states “XXX is not valid to data code A. It must be greater than BB and less than CC.” XXX is the value just entered. A is the data code being modified, BB is the lower limit, and CC is the upper limit. Click on the Continue button and the user will be returned to the Current column. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore, or Baseline: Update the parameters.

Close

Save

Undo

Baseline:

Restore

Update

Edit Selectable Product Parameters

Category:

☐ Cell Product

☐ RCM Product

☐ VAD and RCM Heights

☐ Layer Product

☐ RCM Reflectivity Data Levels

☒ Velocity Data Levels

Select Velocity Table

☒ (Precip 16/0.97)

☐ (Clear Air 16/0.97)

☐ (Precip 16/1.94)

☐ (Clear Air 16/1.94)

☐ (Precip 8/0.97)

☐ (Clear Air 8/0.97)

☐ (Precip 8/1.94)

☐ (Clear Air 8/1.94)

-----INSTRUCTIONS-----

Select a table from the above list. Edits to the + side are reflected in the - side. The allowable value range is from 2 to 122 kts

Velocity Data Levels

Code

Current (knots)

1

ND

2

-64

3

-50

4

-36

5

-26

6

-20

7

-10

8

-1

Code

Current (knots)

9

0

10

10

11

20

12

26

13

36

14

50

15

64

16

RF

Figure 2-55. Velocity Data Levels

2.3.13.2.1.4.7 OHP/THP Data Levels. Click the button or the OHP/THP Data Levels Title. The button will turn white and the OHP/THP Data Levels window opens. See [Figure 2-56](#). Using the password procedures, open the edit fields. The permissible value range is from 0.00 to 12.70 inches in multiples of 0.05. Using the keyboard, enter in the desired numerical value. The value entered represents the minimum value of the data level. Any number that is not an even multiple of 0.05 will be rounded down to the next lowest x.x5 value. Under the Current column, up to five digits can be entered. If a value outside the overall limits of 0.00 to 12.7 inches is entered, a warning_popup opens that states: “DDDD.D is out of range, must be in the range $0.00 \leq X \leq 12.7$ ” where DDDD.D is the value just entered and X is the allowable range. Click on the Continue button. The user is returned to the OHP/THP Data Levels window. Once the desired value has been entered, click to the next entry. If the value is within the allowable range, then the user can continue with the next entry. If the value is outside the allowable range, a warning_popup opens that states: “DDD is not valid for data code element AA, it must be greater than BB and less than CC” where DDD is the value just entered, AA is the data code currently being edited, BB is the value of the data code below AA, and CC is the value of the data code above AA. Click on the Continue button and the user will be returned to the previous window. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore or Baseline: Update the parameters.

Editing changes to the OHP/ THP data levels can be somewhat cumbersome if the desired values fall outside the current ranges of each level. For significant changes in this table, it is recommended to start at the LARGEST DATA LEVEL to be changed and make the desired changes downward to the smallest data level.

Close

Save

Undo

Baseline:

Restore

Update

Edit Selectable Product Parameters

☐ Cell Product

☐ RCM Product

☐ VAD and RCM Heights

Category:

☐ Layer Product

☐ RCM Reflectivity Data Levels

☐ Velocity Data Levels

☐ OHP/THP Data Levels

☐ STP Data Levels

-----INSTRUCTIONS-----
Permissible value range is from
0.0 to 12.7 inches in multiples
of 0.05. The value entered
represents the minimum value
of the data level.

OHP/THP Data Levels

Code	Current (inches)	Code	Current (inches)
1	ND	9	1.50
2	>	10	1.75
3	>=	11	2.00
4	>=	12	2.50
5	>=	13	3.00
6	>=	14	4.00
7	>=	15	6.00
8	>=	16	8.00

Figure 2-56. OHP/THP Data Levels

2.3.13.2.1.4.8 STP Data Levels. Click on the button or the STP Data Levels title. The button will turn white and the STP Data Levels window opens. See [Figure 2-57](#). Using the password procedures described earlier, open the edit fields. The permissible value range is from 0.1 to 25.4 inches in multiples of 0.1. Using the keyboard, enter in the desired numerical value. The value entered represents the minimum value of the data level. Under the Current column, up to four digits can be entered. If a value outside the overall limits of 0.05 to 25.4 inches is entered, a warning_popup opens that states: “DDDD.D is out of range, must be in the range $0.00 \leq X \leq 25.4$ ” where DDDD.D is the value just entered and X is the allowable range. Click on the Continue button. The user is returned to the STP Data Levels window. Once the desired value has been entered, click to the next entry. If the value is within the allowable range, then the user can continue with the next entry. If the value is outside the allowable range, a warning_popup opens that states: “DDD is not valid for data code AA, it must be greater than BB and less than CC” where DDD is the value just entered, AA is the data code currently being edited, BB is the value of the data code below AA, and CC is the value of the data code above AA. Click on the Continue button and the user will be returned to the previous window. Once all changes have been made and they are within the allowable ranges, follow the procedures described earlier to Close, Save, Undo, Baseline: Restore, or Baseline: Update the parameters.

Editing changes to the STP data levels can be somewhat cumbersome if the desired values fall outside the current ranges of each level. For significant changes in this table, it is recommended to start at the LARGEST DATA LEVEL to be changed and make the desired change downward to the smallest data level.

Edit Selectable Product Parameters

Close Save Undo Baseline: Restore Update

Category: ☐ Cell Product ☐ Layer Product ☐ OHP/THP Data Levels
☐ RCM Product ☐ RCM Reflectivity Data Levels ☒ STP Data Levels
☐ VAD and RCM Heights ☐ Velocity Data Levels

STP Data Levels

-----INSTRUCTIONS-----
 Permissible value range is from 0.0 to 25.4 inches in multiples of 0.1. The value entered represents the minimum value of the data level.

Code	Current (inches)	Code	Current (inches)
1	ND	9	3.0
2	>	10	4.0
3	>=	11	5.0
4	>=	12	6.0
5	>=	13	8.0
6	>=	14	10.0
7	>=	15	12.0
8	>=	16	15.0

Figure 2-57. STP Data Levels

2.3.13.2.1.5 Algorithms. Clicking on the Algorithms button opens the Algorithms window. See [Figure 2-58](#). The top line has five buttons and the padlock for the password protected entries. The first button, Close, closes the window and returns the user to the RPG Products window. The four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially grayed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized.

Close

Save

Undo

Baseline:

Restore

Update

Adaptation Item

Combined Shear

Algorithms

Value

Range

Domain (Resolution) [DOR]	1.0	0.5, 1.0, 2.0, 4.0, km
Number (Filter) [NFL]	9	1, 9, 25
Threshold (Combined Shear) [THCS]	2.0	0.0 <= x <= 5.0, E10-3/sec
Elevation Cut [ELEV]	1	1 <= x <= 20, elevation no

Figure 2-58. Algorithms

In order to just view the current values for each algorithm, move the cursor to the second line of the window to the title Adaptation Item, and go to the far right edge inside the background box on the down arrow. Click on this arrow to display a secondary pull-down menu that lists all the algorithms that are editable (i.e., have URC LOCA for one or more values). See [Figure 2-59](#).

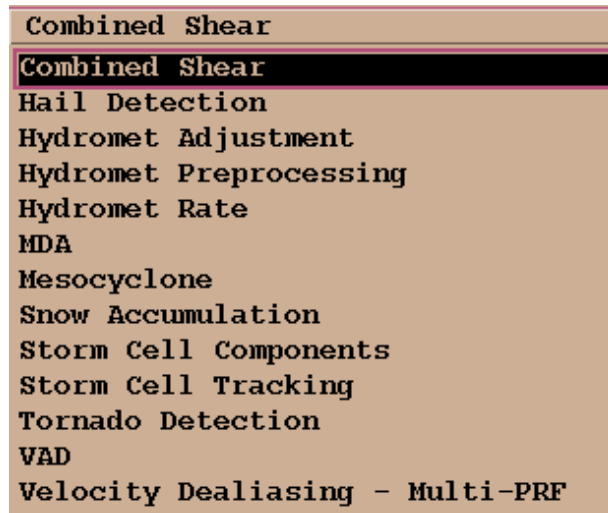


Figure 2-59. Algorithm Adaptation Item Pull Down Menu

By scrolling up and down on the bar on the right side, the user can review the entire list and select the algorithm of interest by clicking on the title. Clicking on that algorithm will put the title into the box labeled Adaptation Item, and refresh the original algorithm window to include all the names, current values, and ranges for the adaptation variables for that particular algorithm. There are presently thirteen algorithms that can be reviewed. The algorithms are individually displayed and the variable parameters discussed in Chapter 8, RPG Products - Algorithms, of the Guidance on Adaptable Parameters Operator Handbook, Volume 4, RPG.

To open the password-protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#).

Enter the new desired value for the various algorithms using the keyboard and press the Return key. If the value falls within the accepted range, then no messages appear, and the Save and Undo buttons on the top row become sensitized. If the value (XX) falls outside the accepted range, a warning_popup window opens that states: “XX should be between AA and BB.” Click on the Continue button and the cursor returns to the block where the incorrect value was originally entered. AA and BB are listed in the third column as the allowable range that can be entered.

Once any desired changes have been made and are within the allowable ranges, the Close, Save, and Undo buttons become sensitized and functional. The Baseline: Restore and Baseline: Update buttons remain grayed-out and desensitized. The Close button will close the window. If the changes have not yet been saved, a warning_popup window opens that states: “You modified adaptable parameters. Do you want to save your changes?” Click on the desired response, Yes or

No. In either case, the user is returned to the RPG Products window. The Save button saves the changes but first brings up a warning_popup window that states: “Are you sure you want to save your changes?” Click on the desired response, Yes or No. The Undo button, undoes all the changes without any warning_popup window. Clicking on Undo removes all the changes and desensitizes the Save and Undo buttons. The Restore button restores the values from the baseline files. Click on the Restore button and a warning_popup window opens that states: “Adaptable parameter modifications will be lost. Are you sure you want to restore from baseline?” Click on the desired response, Yes or No. The Update button takes the changes that have been made and updates the baseline values. Click on the Update button and a warning_popup window opens that states: “Are you sure you want to update baseline adaptation data?” Click on the desired response, Yes or No.

2.3.13.2.1.6 Saving Adaptation Data. There are separate adaptation data files at both the RPG and the MSCF. It is possible to save the files for both sites from either site. Below are the four sets of instructions that provide this capability to the user. The same diskette can be used at both locations as the file names automatically identify the RPG and MSCF adaptation data as two different files.

A check is made to ensure a new adapt file has been placed on the diskette. If a new adapt file fails to show up on the floppy, the user will get the following message:

```
-> ERROR: Unable to save adaptation data. Check floppy!
      Floppy may be bad or write protected
```

If this message is received, then repeat the entire save_adapt_floppy series of commands with a different diskette.

2.3.13.2.1.6.1 Saving RPG Adaptation Data from the RPG. At the RPG Terminal window, regular user account, perform the following steps:

1. At the Command line, enter:
save_adapt_floppy<Return>
2. Feedback will consist of three lines:
 --->Saving Adaptation Data
 --->Insert a new floppy into the floppy drive
 --->Hit return when ready
3. Insert a new floppy into the floppy drive of the RPG
4. Press **<Return>**
5. Feedback will consist of the following:
 --->Mounting floppy
 --->Saving RPG adaptation data to /floppy/floppy0
 Saving RPG adaptation data...
 Saved adaptation data into rpg: /floppy/floppy0/adapt00001.site.rpg.date-time.Z

6. The user will now be returned to the command line.
7. Manually eject the diskette using the button on the disk drive. Label the diskette with the title: RPG Adaptation Data Backup, RPG site, and the date. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the RPG or a new save needs to be performed.

2.3.13.2.1.6.2 Saving RPG Adaptation Data from the MSCF. At the MSCF Terminal window, regular user account, perform the following steps:

1. At the Command line, enter:
save_adapt_floppy -o rpg<Return>
2. Feedback will consist of three lines:
 --->Saving Adaptation Data
 --->Insert a new floppy into the floppy drive
 --->Hit return when ready
3. Insert a new floppy into the floppy drive of the MSCF
4. Press **<Return>**
5. Feedback will consist of the following:
 --->Mounting floppy
 --->Saving RPG adaptation data to /floppy/floppy0
 Saving RPG adaptation data.
 Saved adaptation data into rpg: /floppy/floppy0/adapt00001.site.rpg.date-time.Z
6. The user will now be returned to the command line.
7. Manually eject the diskette using the button on the disk drive. Label the diskette with the title: RPG Adaptation Data Backup, RPG site, and the date. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the RPG or a new save needs to be performed.

2.3.13.2.1.6.3 Saving MSCF Adaptation Data from the RPG. At the RPG Terminal window, regular user account, perform the following steps:

1. At the Command line, enter:
save_adapt_floppy -o mscf<Return>
2. Feedback will consist of three lines:
 --->Saving Adaptation Data
 --->Insert a new floppy into the floppy drive
 --->Hit return when ready

3. Insert a new floppy into the floppy drive of the RPG
4. Press **<Return>**
5. Feedback will consist of the following:
 - >Mounting floppy
 - >Saving RPG adaptation data to /floppy/floppy0
 - Saving RPG adaptation data...
 - Saved adaptation data into rpg: /floppy/floppy0/adapt00001.site.mscf.date-time.Z
6. The user will now be returned to the command line.
7. Manually eject the diskette using the button on the disk drive. Label the diskette with the title: MSCF Adaptation Data Backup, RPG site, and the date. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the MSCF or a new save needs to be performed.

2.3.13.2.1.6.4 Saving MSCF Adaptation Data from the MSCF. At the MSCF Terminal window, regular user account, perform the following steps:

1. At the Command line, enter:
save_adapt_floppy<Return>
2. Feedback will consist of three lines:
 - >Saving Adaptation Data
 - >Insert a new floppy into the floppy drive
 - >Hit return when ready
3. Insert a new floppy into the floppy drive of the MSCF
4. Press **<Return>**
5. Feedback will consist of the following:
 - >Mounting floppy
 - >Saving RPG adaptation data to /floppy/floppy0
 - Saving RPG adaptation data...
 - Saved adaptation data into rpg: /floppy/floppy0/adapt00001.site.mscf.date-time.Z
6. The user will now be returned to the command line.
7. Manually eject the diskette using the button on the disk drive. Label the diskette with the title: MSCF Adaptation Data Backup, RPG site, and the date. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the MSCF or a new save needs to be performed.

2.3.13.2.1.7 Restoring Adaptation Data. There are separate adaptation data files at both the RPG and the MSCF. It is possible to restore the files for both sites from either site. Below are the four sets of instructions that provide this capability to the user.

2.3.13.2.1.7.1 Restoring RPG Adaptation Data from the RPG. At the RPG Terminal, regular user account, perform the following steps:

1. At the Command line, enter:
restore_adapt_floppy<Return>
2. Feedback will consist of three lines:
 --->Restoring from Floppy
 --->Insert the adaptation backup floppy into the floppy drive
 --->Hit return when ready
3. Push the diskette with the adaptation data previously recorded into the RPG disk drive.
4. Press **<Return>**
5. Feedback will consist of the following:
 --->Mounting floppy
 --->Restoring RPG adaptation data from /floppy/floppy0
 Restoring adaptation data...
 Restored adaptation data from rpg: /floppy/floppy0/adapt00001.site.rpg.date-time.Z
 The restored adaptation data will be used on the next application startup.

NOTE

There is no need to enter in the date/time of the most recent restored RPG adaptation data file. The software automatically looks at all the RPG adaptation data dates and selects the most recent one. Therefore the operator can use the same diskette for numerous saves of the adaptation data without any problem of older files being restored on the system.

6. The user will now be returned to the command line.
7. To get the floppy diskette out of the drive, enter the following command:
eject<Return>
8. Feedback will consist of the following:
 /vol/dev/rdiskette0/unnamed_floppy #1 can now be manually ejected
9. Removable Media Manager Window appears with the same text and an OK button. Click on the OK button and then push on the manual button to remove the diskette. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the RPG or a new save needs to be performed.

10. To perform the next application startup, go to the RPG, open a terminal window, and at the user prompt, enter:

mrpg shutdown<Return>

Wait for the State: box, center of HCI, top line above the RPG Box to turn red and read: State: SHUTDOWN.

The last line on the terminal window will read: RPG Processes are notified to shut down.

Then, at the user prompt, enter:

mrpg startup<Return>

When the State: box turns to green and reads: State: OPERATE, the operator is finished. This will incorporate the new adaptation data for the RPG and the MSCF.

2.3.13.2.1.7.2 Restoring RPG Adaptation Data from the MSCF. At the MSCF Terminal, regular user account, perform the following steps:

1. At the Command line, enter:

restore_adapt_floppy -o rpg<Return>

2. Feedback will consist of three lines:

--->Restoring from Floppy

--->Insert the adaptation backup floppy into the floppy drive

--->Hit return when ready

3. Push the diskette with the adaptation data previously recorded into the MSCF disk drive.

4. Press **<Return>**

5. Feedback will consist of the following:

--->Mounting floppy

--->Restoring RPG adaptation data from /floppy/floppy0

Restoring adaptation data...

Restored adaptation data from rpg: /floppy/floppy0/adapt00001.site.rpg.date-time.Z

The restored adaptation data will be used on the next application startup.

NOTE

There is no need to enter in the date/time of the most recent restored RPG adaptation data file. The software automatically looks at all the RPG adaptation data dates and selects the most recent one. Therefore the operator can use the same diskette for numerous saves of the RPG adaptation data without any problem of older files being restored on the system.

6. The user will now be returned to the command line.

7. To get the floppy diskette out of the drive, enter the following command:

eject<Return>

8. Feedback will consist of the following:

/vol/dev/rdiskette0/unnamed_floppy #1 can now be manually ejected

9. Removable Media Manager Window appears with the same text and an OK button. Click on the OK button and then push on the manual button to remove the diskette. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the RPG or a new save needs to be performed.

10. To perform the next application startup, go to the RPG, open a terminal window, and at the user prompt, enter:

mrpg shutdown<Return>

Wait for the State: box, center of HCI, top line above the RPG Box to turn red and read: State: SHUTDOWN.

The last line on the terminal window will read: RPG Processes are notified to shut down.

Then, at the user prompt, enter:

mrpg startup<Return>

When the State: box turns to green and reads: State: OPERATE, the operator is finished. This will incorporate the new adaptation data for the RPG and the MSCF.

2.3.13.2.1.7.3 Restoring MSCF Adaptation Data from the RPG. At the RPG Terminal window, regular user account, perform the following steps:

1. At the Command line, enter:

restore_adapt_floppy -o mscf<Return>

2. Feedback will consist of three lines:

--->Restoring from Floppy

--->Insert the adaptation backup floppy into the floppy drive

--->Hit return when ready

3. Push the diskette with the adaptation data previously recorded into the RPG disk drive.

4. Press **<Return>**

5. Feedback will consist of the following:

--->Mounting floppy

--->Restoring RPG adaptation data from /floppy/floppy0

Restoring adaptation data...

Restored adaptation data from rpg: /floppy/floppy0/adapt00001.site.mscf.date-time.Z

The restored adaptation data will be used on the next application startup.

NOTE

There is no need to enter in the date/time of the most recent restored MSCF adaptation data file. The software automatically looks at all the MSCF adaptation data dates and selects the most recent one. Therefore the operator can use the same diskette for numerous saves of the MSCF adaptation data without any problem of older files being restored on the system.

6. The user will now be returned to the command line.

7. To get the floppy diskette out of the drive, enter the following command:

eject<Return>

8. Feedback will consist of the following:

/vol/dev/rdiskette0/unnamed_floppy #1 can now be manually ejected

9. Removable Media Manager Window appears with the same text and an OK button. Click on the OK button and then push on the manual button to remove the diskette. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the MSCF or a new save needs to be performed.

10. To perform the next application startup, go to the RPG, open a terminal window, and at the user prompt, enter:

mrpg shutdown<Return>

Wait for the State: box, center of HCI, top line above the RPG Box to turn red and read: State: SHUTDOWN.

The last line on the terminal window will read: RPG Processes are notified to shut down.

Then, at the user prompt, enter:

mrpg startup<Return>

When the State: box turns to green and reads: State: OPERATE, the operator is finished. This will incorporate the new adaptation data for the RPG and the MSCF.

2.3.13.2.1.7.4 Restoring MSCF Adaptation Data from the MSCF. At the MSCF Terminal, regular user account, perform the following steps:

1. At the Command line, enter:
restore_adapt_floppy<Return>
2. Feedback will consist of three lines:
--->Restoring from Floppy
--->Insert the adaptation backup floppy into the floppy drive
--->Hit return when ready
3. Push the diskette with the adaptation data previously recorded into the MSCF disk drive.
4. Press **<Return>**
5. Feedback will consist of the following:
--->Mounting floppy
--->Restoring RPG adaptation data from /floppy/floppy0
Restoring adaptation data...
Restored adaptation data from rpg: /floppy/floppy0/adapt00001.site.mscf.date-time.Z
The restored adaptation data will be used on the next application startup.

NOTE

There is no need to enter in the date/time of the most recent restored MSCF adaptation data file. The software automatically looks at all the MSCF adaptation data dates and selects the most recent one. Therefore the operator can use the same diskette for numerous saves of the MSCF adaptation data without any problem of older files being restored on the system.

6. The user will now be returned to the command line.
7. To get the floppy diskette out of the drive, enter the following command:
eject<Return>
8. Feedback will consist of the following:
/vol/dev/rdiskette0/unnamed_floppy #1 can now be manually ejected
9. Removable Media Manager Window appears with the same text and an OK button. Click on the OK button and then push on the manual button to remove the diskette. Store the diskette in a safe, secure location where it can be easily retrieved in case the adaptation data needs to be restored on the MSCF or a new save needs to be performed.
10. To perform the next application startup, go to the RPG, open a terminal window, and at the user prompt, enter:
mrpg shutdown<Return>

Wait for the State: box, center of HCI, top line above the RPG Box to turn red and read: State: SHUTDOWN.

The last line on the terminal window will read: RPG Processes are notified to shut down.

Then, at the user prompt, enter:

mrpg startup<Return>

When the State: box turns to green and reads: State: OPERATE, the operator is finished. This will incorporate the new adaptation data for the RPG and the MSCF.

2.3.13.2.2 Display - Products in Database. Click on the Products in Database button and the Products in Database window opens. See [Figure 2-60](#). The top line of the window contains the Close button in the upper left hand corner (which closes the window and returns the user to the RPG Products window) and a text string which describes the current volume number and its start date/time. This field is not editable by the operator. There are two buttons that are used to identify specific products. These are the Search Date/Time button and the Select Product button. Click on either of the two buttons.

If there are no products in the data base, the Products in Database window will not appear, but instead a warning_popup appears that states: "No Products in Database." Click on the Continue button, and the operator is returned to the RPG Products window. This warning_popup is not the Products in Database window and will not be replaced by it when products first exist in the products database. The operator must close the warning_popup and reselect the Products in database button. When the RPG is started with a clean database, the first products start appearing after the first elevation cut is completed. In addition, once the product database contains products, the Products in Database window will only refresh itself at the start of each volume.

Products in Database - (FAA:2)

Close

Current Volume 246 Start: Jul 21, 2004 - 14:18:02 UT

Search Date/Time

Jul 21, 2004 - 14:18:02 UT

Select Product

All Products

MNE[id]	Volume: Date - Time	Expire: Date - Time	Cut
CLD[133]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 17:17:54 UT]	0.5
CLR[132]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 17:17:54 UT]	0.5
SPD[82]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 17:20:19 UT]	N/A
DPA[81]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 17:20:19 UT]	N/A
STP[80]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 17:20:19 UT]	N/A
THP[79]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 17:20:19 UT]	N/A
OHP[78]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 17:20:19 UT]	N/A
UAM[73]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 14:27:54 UT]	N/A
UAM[73]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 14:27:53 UT]	N/A
SRM[56]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 14:30:44 UT]	8.0
SRM[56]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 14:29:44 UT]	3.1
SRM[56]	[Jul 21, 2004 - 14:18:02 UT]	[Jul 21, 2004 - 14:29:29 UT]	2.4

Select product(s) from Select Product list.
Select Volume(s) from the Search Date/Time list.

Figure 2-60. Products in Database

2.3.13.2.2.1 Search Date/Time Box. Move the cursor to the far right side of the box under the Search Date/Time title and click on the down arrow. This opens a drop down menu of options. Select the option desired by moving the cursor to the line and clicking. The selected line will be highlighted by changing to a white background with blue letters and display the products from that volume in the section in the middle of the page. The section contains the MNE (id.), Volume, Date, and Time, the Expiration: Date and Time, and the elevation Cut of the product where applicable.

2.3.13.2.2.2 Select Product Box. Move the cursor to the far right side of the box under the Select Product title and click on the down arrow. This opens a drop down menu of options. The default is All Products. Select the option desired by moving the cursor to the line and clicking. The selected line will be highlighted by changing to a white background with blue letters and display the products on the section in the middle of the page.

2.3.13.3 RPG Status. Click on the Status button in the RPG icon and the RPG Status window opens. See Figure 2-61. The top line consists of a Close button (which closes the window) and a Print Log Messages button.

RPG Status

Close Print Log Messages

RPG Mode

OPERATE

Wx Mode

CLEAR AIR (B)

Maintenance Required

- Distribution
- Data Base Failure
- Task Failure
- BDDS

RPG Alarm Summary

- Control Task Failure
- RDA Wideband
- Media Failure

Load Shed

- CPU
- Product Storage
- RDA Radial
- RPG Radial
- Distribution

Prev

Next

Display: ☒ Status ☒ Error ☒ RPG Alarm ☐ RDA Alarm

Search:

Clear

Message Filter

System Log Messages

May 18, 04 [18:46:14] >> Vol: 49 RDA Clock: 04/21/96 14:32:41 VCP: 32

May 18, 04 [18:46:14] >> Weather Mode is now Clear Air (B)

May 18, 04 [18:46:13] >> RDA STATUS: Vcp=R32, ISU=Disabled, ArchII=Record

May 18, 04 [18:46:13] >> RDA STATUS: ArchII=Not Installed

May 18, 04 [18:46:13] >> RDA STATUS: Oper=On-Line, Aux Pwr=Off Gen=Off, Vcp=R0

May 18, 04 [18:46:10] >> **RPG ALARM CLEARED: RDA <-> RPG COMMUNICATIONS LINK BROKEN**

May 18, 04 [18:46:10] >> Wideband Line is CONNECTED

May 18, 04 [18:45:27] >> Narrow Band line 42 has CONNECT PENDING

May 18, 04 [18:45:27] >> Narrow Band line 42 is DISCONNECTED

May 18, 04 [18:45:27] >> Narrow Band line 42 experienced UNSOLICITED DISCONNECT

May 18, 04 [18:45:16] >> Narrow Band line 42 is CONNECTED

May 18, 04 [18:42:38] >> RPG WARNING CLEARED: PRODUCT DISTRIBUTION LOAD SHED

May 18, 04 [18:42:32] >> Narrow Band line 33, Comm. RETURNED to NORMAL from WARNING

May 18, 04 [18:42:32] >> **Narrow Band line 33, Comm. OVERLOAD CRITICAL, PRODUCTS SHED**

May 18, 04 [18:42:20] >> RPG WARNING ACTIVATED: PRODUCT DISTRIBUTION LOAD SHED

May 18, 04 [18:42:10] >> Narrow Band line 33, Comm. OVERLOAD WARNING

May 18, 04 [18:40:56] >> **RPG ALARM ACTIVATED: RDA <-> RPG COMMUNICATIONS LINK BROKEN**

May 18, 04 [18:40:55] >> **Wideband Line has FAILED**

May 18, 04 [18:40:46] >> Narrow Band line 3 has CONNECT PENDING

May 18, 04 [18:40:46] >> Narrow Band line 3 is DISCONNECTED

Figure 2-61. RPG Status

The first block of information contains three individual areas: RPG State, RPG Mode, and Wx (Weather) Mode. These are color coded and automatically updated, but are not editable by the user. These three selections display the following information:

RPG State:	Background Color:
OPERATE	Green
TRANSITION	Yellow
STANDBY	Red
POWER FAIL	Red
SHUTDOWN	Red
FAILED	Red
UNKNOWN	Red
RPG Mode:	Background Color:
OPERATE	Green
TEST	Yellow
Weather Mode:	Background Color:
PRECIPITATION (A)	Green
CLEAR AIR (B)	Green

2.3.13.3.1 RPG Alarm Summary. The second block of information, called “RPG Alarm Summary”, contains three more areas: Maintenance Required, Maintenance Mandatory, and Load Shed. See [Figure 2-62](#).

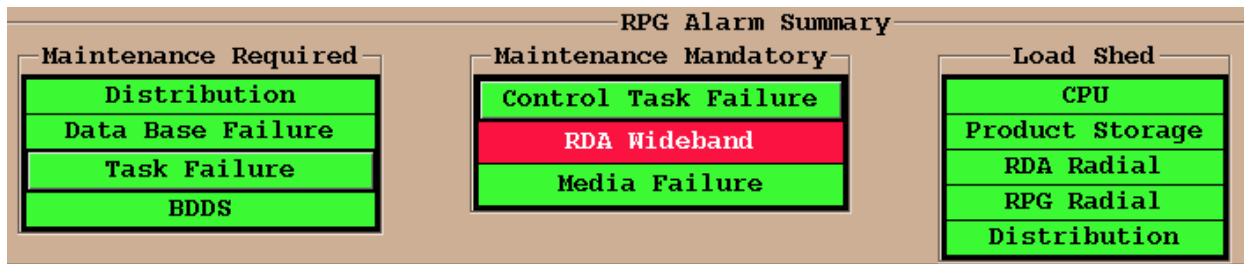


Figure 2-62. RPG Alarm Summary

If no alarms are present, all listings have a green background with black letters. If an alarm becomes active, the background turns to red and has white letters. These are automatically updated but are not editable by the user. Additional information is available from two of the fields on this window; “Task Failure” under Maintenance Required and “Control Task Failure” under Maintenance Mandatory.

Click on the “Task Failure” bar under the Maintenance Required column and another window opens, titled “Failed Task List” ([Figure 2-63](#)). This is a list of all the non-control tasks that have

failed. If there are no non-control task failures, the message “No failed non-control tasks” will be present.

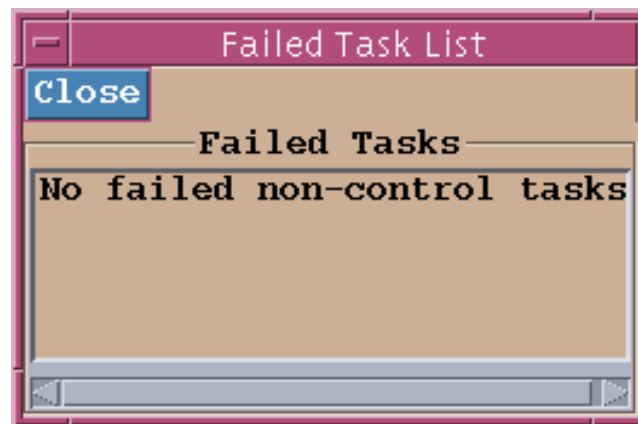


Figure 2-63. Failed Task List

Click on the “Control Task Failure” bar under the Maintenance Mandatory column and another window opens, titled “Failed Control Task List” (Figure 2-64). This is a list of all of the control tasks that have failed. If there are no control task failures, the message “No failed control tasks” will be present.

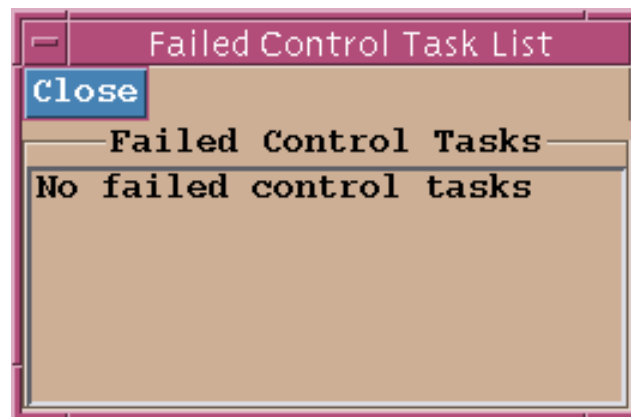


Figure 2-64. Failed Control Task List

2.3.13.3.2 Message Filter. The third block is the Message Filter. The first entry is “Previous - left arrow - right arrow - Next”. This allows the operator to select the page of System Log Messages that is currently displayed in the bottom half of the window. There are eight pages of 250 messages each. By default, the newest 250 messages are displayed in the first page. Use the scroll bar on the right hand side of the System Log Messages window to scroll through the entire 250 messages on that page. When viewing the newest messages, the left arrow is grayed-out and desensitized, and the right arrow is white with a blue background and sensitized. Clicking on the

right arrow refreshes the System Log Messages with the next page of 250 messages. Once the operator reaches the last page (oldest 250 messages), the right arrow is grayed-out and desensitized. The eight pages will hold a total of 2,000 messages.

Three preselected categories of messages are available for viewing; Display: Status, Error, and RPG Alarm. By clicking on either the box or the title itself, the type of message can be selected. These can be turned on or off with a check mark in the box signifying that type of message has been selected. When selected (or deselected), the actual log of messages below this line refreshes with the appropriate change(s). The Status messages are black lettering, the Alarm messages are color coded red, and the Error messages are color coded yellow.

The RDA Alarm button between RPG Alarm and Search: will allow selection of which RDA alarm(s) to filter. Clicking on the RDA Alarm button brings up a window titled "RDA Alarm" (Figure 2-65). From this window, selection of which RDA alarm to include and/or exclude in the System Log Messages can be turned on/off by clicking on either the arrow or the alarm name. There is a Close button in the upper left hand corner that closes this window.

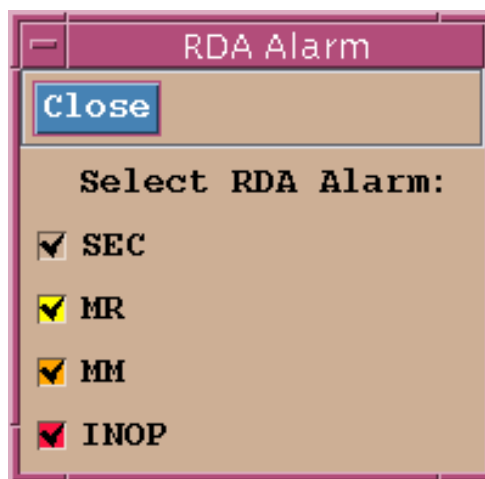


Figure 2-65. RDA Alarm

The Search: field provides the user the opportunity to enter a string of characters that searches through the listed alarms and lists only those whose characters match the entered string. The Search field is not case sensitive but it can include numbers and other keyboard characters. Click on the box, enter the desired string, and press Return. The log of messages will refresh with only those messages containing that string of characters. The Clear button to the far right clears out the Search field and returns the log of messages to the original unfiltered display.

2.3.13.3.3 System Log Messages. The large block titled "System Log Messages" contains a listing of the 250 messages for the selected page. If there are less than 250 messages, they will all appear on the default first page. If a sort has been done using the three specific categories, the Search entry method, or the RDA Alarm window, the sort will look at all 2,000 messages, then display according to the sorted criteria. If the sort results in less than 250 messages, they will all

be contained on the first page. If the sort results in more than 250 messages, additional pages will be available to view the remaining messages. Use the scroll bar along the right hand side to view the 250 messages on each page. Use the scroll bar along the bottom to view longer messages. The maximum messages available is 2000.

2.3.13.3.4 Print RPG Log Messages. Click on the Print Log Messages button and a secondary window opens that is titled “Print RPG Log Messages.” See [Figure 2-66](#). The default selection is Print All Messages. If a specific number of messages is desired to be printed instead, click on the box with a check mark or anywhere on the Print All Messages title and it becomes desensitized. Move the cursor to the box in the middle of the line below that states Print XXX messages, click, and the numeric block becomes active with a blinking cursor. Type in the number of messages desired (up to four digits can be entered) and then click on either the Print or the Cancel button. If a value has been entered that exceeds the limit, a warning_popup appears that states: "You entered an invalid number of messages to print (XXXX). It should be in the range 1 to 2,000." XXXX is the value entered. Click on the Continue button and the user is returned to the Print RPG Log Messages window. The default number of messages to be printed is 2,000. To return to the Print All Messages value, click on the square or the title; it acts as a toggle switch. The block turns white and contains a black check mark while the numeric block becomes grayed-out and desensitized. After clicking on the Print or the Cancel button, the user is returned to the RPG Status window.

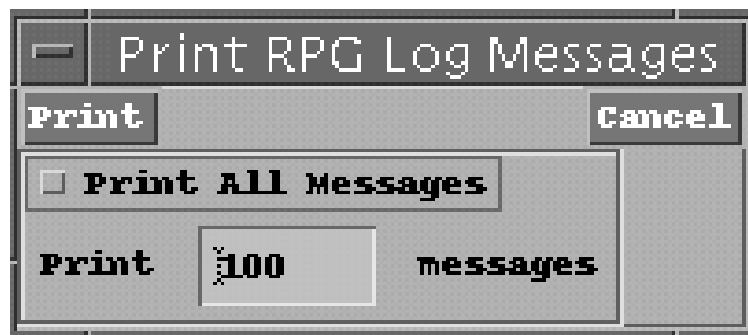


Figure 2-66. Print RPG Log Message

2.3.13.4 RMS Button. This button is visible only on the FAA redundant systems with RMS installed. See [Figure 2-67](#). It is located inside the RPG Control box in the HCI as the fourth button (under the Control, Products, and Status buttons). If the RMS button has a blue background, then the RMS interface is functioning. If the RMS button has a red background, then the RMS interface is inoperative.

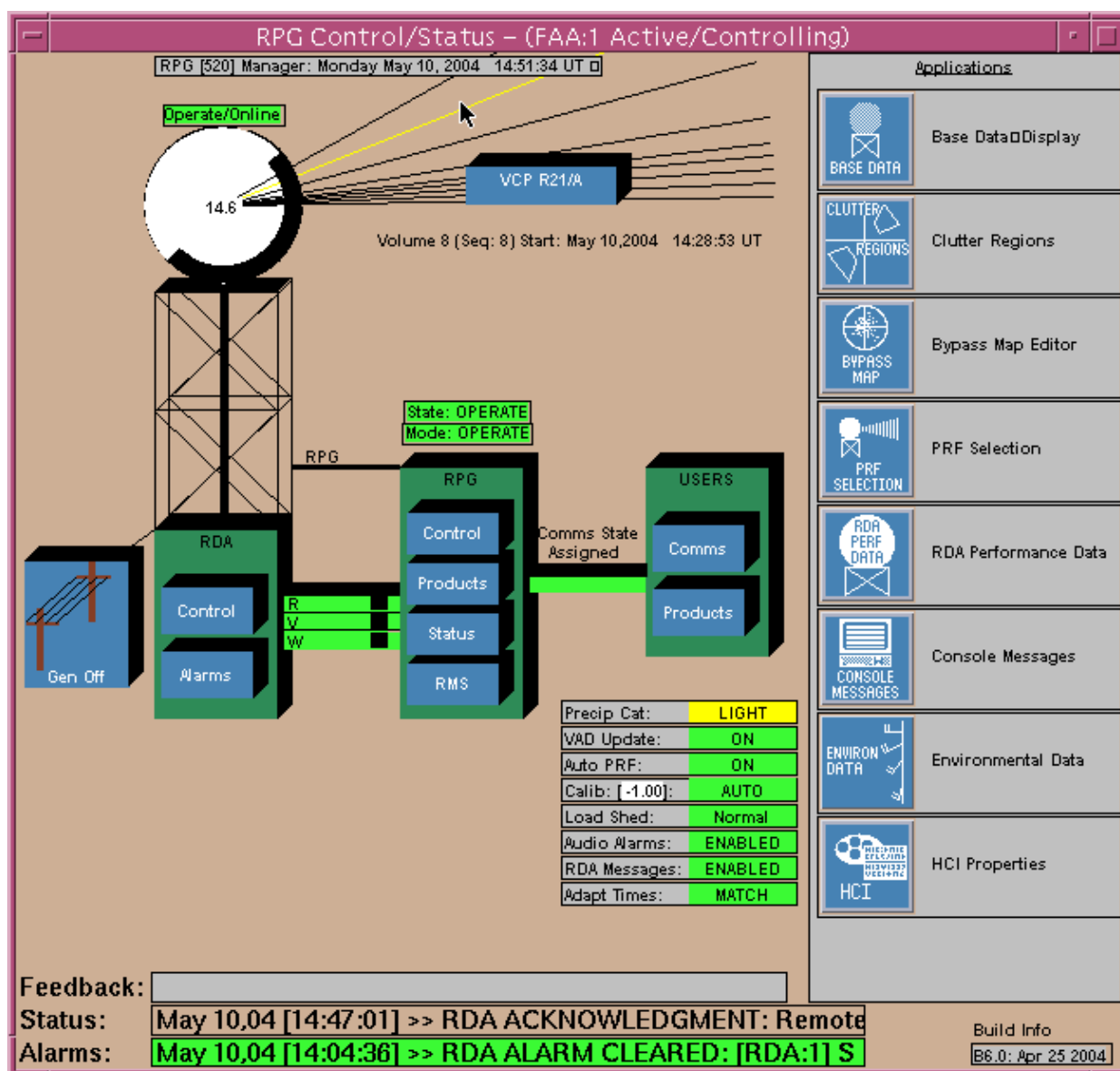


Figure 2-67. RPG Control/Status - FAA

2.3.13.4.1 RMS Messages (FAA: 1 or 2) Window. Click on the RMS button and the RMS Messages (FAA: 1 or 2) window opens. See [Figure 2-68](#). The RMS Messages (FAA: 1 or 2) window has a Close button in the upper left hand corner. Clicking on the Close button returns the user to the HCI. Under the title RPG to RMS Messages, there are two choices: RMS Inhibit and RMS Free Text. Click on either one of those choices and a separate window opens when the RMS interface is functioning. If the RMS interface is not functioning, clicking on either the RMS Inhibit button or the RMS Free Text button will bring up a warning_popup that states: "RMS interface is down." Click on OK and the user is returned to the HCI.



Figure 2-68. RMS Messages

2.3.13.4.1.1 RMS Inhibit Time Window. Clicking on the RMS Inhibit button brings up the RMS Inhibit Time window. See [Figure 2-69](#).

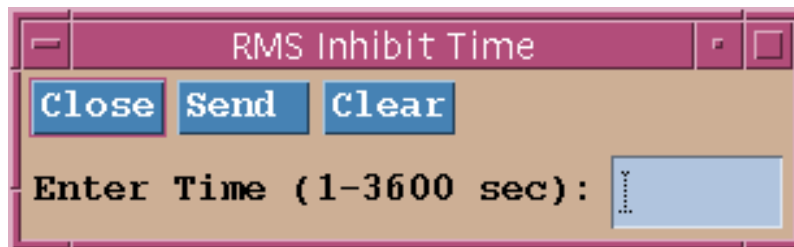


Figure 2-69. RMS Inhibit Time

The top line contains three control buttons. The Close button closes the window and returns the user to the RMS Messages window. The Send button sends the time period entered in the second row of this same window to the RMS to be used as the time period that no commands will be accepted from the RMS to the RPG. This time period is effective as of the send time. The Clear button clears the data entry box in the second line.

The second line of this window contains the title Enter Time (1-3600 sec): and a data entry box. Click on the data entry box, have the blinking cursor in the left hand side of the box, and the user can then enter in a time period from 1 second to 3,600 seconds. This will be the desired time period that the RMS can not send any commands to the RPG. If an invalid entry is made and the Send button is clicked (or the Return key pressed), a warning_popup opens that states: “Value must be between 1 and 3600. Do you want to change the value?” Click on Yes or No. Clicking on Yes will return the user to the RMS Inhibit Time window. Clicking on No will return the user to the RMS Messages window. Once the desired value is entered, click on the Send button to send the time period to the RMS.

2.3.13.4.1.2 RMS Free Text Message Window. Clicking on the RMS Free Text button brings up the RMS Free Text Message window. See [Figure 2-70](#).



Figure 2-70. RMS Free Text Message

The top line contains three control buttons. The Close button closes the window and returns the user to the RMS Messages window. The Send button sends the free text message entered in the bottom data entry block of this same window to the RPG. The Clear button clears the data entry box of any previous input.

The second line of this window contains the title Free Text Message: and a data entry box. Click on the data entry box, have the blinking cursor in the upper left hand corner of the box, and the user can then enter in any type of free text message that is desired to be sent to the RMS. A maximum of 400 characters can be entered in the data entry box. If more than 400 are entered and the Send button clicked, a warning_popup appears that states: "RMS messages cannot exceed 400 characters. Message is XXX characters long. Do you want to change it?" XXX is the number of characters entered. Click on Yes to return to the data entry box to make the appropriate changes. Click on No and the user is returned to the RMS Free Text Message window with the message not sent nor edited. Once the text has been completely entered, click on the Send button and the text message is sent to the RMS.

2.3.14 Narrowband Connections Graphics.

Located between the RPG icon and the Users icon is a graphic consisting of one green bar that represents the narrowband connections. There is also an additional small black box that repeatedly moves within the bar from left to right (RPG icon to the Users icon) that represents the flow of product data. Clicking on this graphic (when the cursor changes to a pointing hand) brings up the Product Distribution Comms Status window that contains information about the configuration and status of every RPG communications line. See [Figure 2-72](#). The Product Distribution Comms Status window is described in detail in paragraph [2.3.15.1](#)

If the connecting bar is white and has a red block moving from left to right, that means the RPG is in test mode and that only the RPGOP is receiving any products.

2.3.15 USERS Icon.

The right third of the RPG Control/Status window is devoted to user functions. There are two buttons within the USERS icon that provide links to other windows. They are the Comms button

and the Products button. See Figure 2-71. Click the cursor on the respective button and the following windows will be opened:

Comms button opens the Product Distribution Comms Status window
 Products button opens the RPG Product Distribution Control window

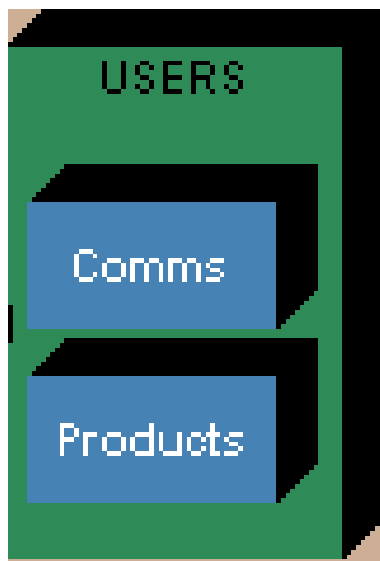


Figure 2-71. USERS Icon

2.3.15.1 Product Distribution Comms Status (PDCS) Window. Click on the Comms button in the USERS icon and the Product Distribution Comms Status (PDCS) window opens. See Figure 2-72. The top line has five buttons and the padlock for the password protected entries. The first button, Close, closes the window and returns the user to the HCI. The other four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially greyed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become greyed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are greyed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized.

If an edit has been made and not saved or undone, and the Close button is clicked, a warning_popup will appear that states: “Do you want to save your product distribution comms data changes?” Click on either Yes or No. Answering Yes will save the changes and send the user back to the HCI. Answering No will not save the changes but still send the user back to the HCI.

Product Distribution Comms Status

Close Save Undo

Baseline: Restore Update

Line Management

Line # 1 [X25]

Type Dial-in

Port Psd LINE

Baud Rate 14400

Comm Mgr # 1

PServer # 1

Time Limit 60

Comms Option No

User ID

User Name

Class

Method

Prev [Users 1 to 20 of 889] Next

User ID/Name Psd Ovr T Limit Class Method

1 [HOTLINE] HOTLINE 60 2 2 N/A

2 [ADS2] PASSWD 60 2 2 N/A

3 [ADS3] PASSWD 60 2 2 N/A

4 [ADS4] PASSWD 60 2 2 N/A

5 [ADS5] PASSWD 60 2 2 N/A

6 [ADS6] PASSWD 60 2 2 N/A

7 [ADS7] PASSWD 60 2 2 N/A

8 [ADS8] PASSWD 60 2 2 N/A

9 [ADS9] PASSWD 60 2 2 N/A

10 [ADS10] PASSWD 60 2 2 N/A

11 [ADS11] PASSWD 60 2 2 N/A

Product Distribution Lines

Line	Type	Enabled	Proto	ID	User Name	Class	Status	Delay	Rate
1	DIALIN	yes	X25			2	CON PEND	0%	-
2	DIALIN	yes	X25			2	CON PEND	0%	-
3	DIALIN	yes	X25			2	CON PEND	0%	-
4	DIALIN	yes	X25			2	CON PEND	0%	-
5	DIALIN	yes	X25			2	CON PEND	0%	-
6	DIALIN	yes	X25			2	CON PEND	0%	-
7	DIALIN	yes	X25			2	CON PEND	0%	-
8	DIALIN	yes	X25			2	CON PEND	0%	-
9	DEDIC	yes	X25		RPGOP_50		CON PEND	0%	-
10	DEDIC	yes	X25			1	CON PEND	0%	-
11	DEDIC	yes	X25			1	CON PEND	0%	-
12	DEDIC	yes	X25			1	CON PEND	0%	-
13	DEDIC	yes	X25			1	CON PEND	0%	-
14	DEDIC	yes	X25			1	CON PEND	0%	-
15	DEDIC	yes	X25			1	CON PEND	0%	-
16	DEDIC	yes	X25			1	CON PEND	0%	-
17	DEDIC	yes	X25			1	CON PEND	0%	-
18	DEDIC	yes	X25			1	CON PEND	0%	-
19	DEDIC	yes	X25			1	CON PEND	0%	-
20	DEDIC	yes	X25			1	CON PEND	0%	-
21	DEDIC	yes	X25			1	CON PEND	0%	-
22	DEDIC	yes	X25			1	CON PEND	0%	-
23	DEDIC	yes	X25			1	CON PEND	0%	-
24	DEDIC	yes	X25			1	CON PEND	0%	-

Prev --- Next Sorted By: Line Type Status

Line Control

Reset Disconnect Connect Deselect

General Parameters

Retries 2 Timeout 120 Alarm (%) 100 Warning (%) 95

Add Dial-in User

Delete Dial-in User

Figure 2-72. Product Distribution Comms Status - Lines 1-24 - Sheet 1 of 2

Product Distribution Comms Status

Close Save Undo Baseline: Restore Update

Line Management

Line # 25 [TCP] Comm Mgr # 4

Type Dedicated PServer # 4

Port Pswd Time Limit

Baud Rate 1000000 Comms Option No

User ID Class RPGOP

User Name Method

Line Management

Line	Type	Enabled	Proto	ID	User Name	Class	Status	Delay	Rate
25	DEDIC	Yes	TCP		RPGOP_90		CON PEND	0%	
26	WAN	Yes	TCP			2	CON PEND	0%	
27	WAN	Yes	TCP			2	CON PEND	0%	
28	WAN	Yes	TCP			2	CON PEND	0%	
29	WAN	Yes	TCP			2	CON PEND	0%	
30	WAN	Yes	TCP			2	CON PEND	0%	
31	WAN	Yes	TCP			2	CON PEND	0%	
32	WAN	Yes	TCP			2	CON PEND	0%	
33	DEDIC	Yes	TCP		RPGOP_50		CON PEND	0%	
34	DEDIC	Yes	TCP		RPGOP_50		CON PEND	0%	
35	DEDIC	Yes	TCP		RPGOP_50		CON PEND	0%	
36	DEDIC	Yes	TCP		RPGOP_50		CON PEND	0%	
37	DEDIC	Yes	TCP		RPGOP_50		CON PEND	0%	
38	DIALIN	Yes	TCP			2	CON PEND	0%	
39	DIALIN	Yes	TCP			2	CON PEND	0%	
40	DIALIN	Yes	TCP			2	CON PEND	0%	
41	WAN	Yes	TCP			2	CON PEND	0%	
42	WAN	Yes	TCP			2	CON PEND	0%	

Dial-in Users

Prev [Users 1 to 20 of 891] Next

User ID/Name	Pswd	Ovr	T	Limit	Class	Method
1 [HOTLINE]	HOTLINE			60	2	N/A
2 [ADS2]	PASSWD			60	2	N/A
3 [ADS3]	PASSWD			60	2	N/A
4 [ADS4]	PASSWD			60	2	N/A
5 [ADS5]	PASSWD			60	2	N/A
6 [ADS6]	PASSWD			60	2	N/A
7 [ADS7]	PASSWD			60	2	N/A
8 [ADS8]	PASSWD			60	2	N/A
9 [ADS9]	PASSWD			60	2	N/A
10 [ADS10]	PASSWD			60	2	N/A
11 [ADS11]	PASSWD			60	2	N/A

Add Dial-in User Delete Dial-in User

Prev --- Next Sorted By: Line Type Status

Line Control

Reset Disconnect Connect Deselect

General Parameters

Retries 2 Timeout 120 Alarm (%) 100 Warning (%) 95

Figure 2-72. Product Distribution Comms Status - Lines 25 - 42 - Sheet 2 of 2

2.3.15.1.1 Password. To make any changes in the General Parameters, Line Management, or Dial-In Users Areas, the appropriate level password must be entered. To open the password protected fields for edit, follow the procedures described in paragraph.

2.3.15.1.2 Product Distribution Lines Section. The first major section in the left hand side of the window is the Product Distribution Lines listing. It is organized into ten columns which are defined as follows:

- Line RPG narrowband line number
- Type DEDIC or DIALIN
- Enabled Yes or No
- Proto x25 Protocol or TCP
- ID ID number of the user connected to that line
- User Name User Name connected to that line (currently empty)
- Class Class of user (1, 2, 4, RPGOP_50 or RPGOP_90) that is connected to that line. The class number displayed for a particular line may change when a user connects. This happens when the line default class is different from the user class. This applies only to dial-in users as they must identify themselves before they are connected.
- Status CONNECT, DISCON, or CON PEND
- Delay An estimated percent of current VCP time by which products leaving the distribution queue are delayed (e.g., a value of 50% during vcp 11 = an estimated delay of 2.5 minutes, 25% = 1.25 minutes, etc.).
- Rate The estimated currently achieved data transmission rate for a given distribution line. Units are integers representing bytes, kilobytes, or megabytes/seconds, the latter two being distinguished by an alpha qualifier to the values' immediate right (e.g., a value of 1 in the Rate column = 1 byte/second, 1K = 1 kilobyte/second, 1M = 1 megabyte/second).

2.3.15.1.2.1 Prev-Next Arrows. Directly under the first three columns are the Prev-Next arrows. When the first screen of 24 lines is displayed, the "Prev" arrow is grayed-out and desensitized, and the "Next" arrow is colored white with a blue background and sensitized. Click on the sensitized arrow and the second screen of the remaining 18 lines is displayed.

When the second screen of 18 lines is displayed, the "Next" arrow is grayed-out and desensitized, and the "Prev" arrow is colored white with a blue background and sensitized. Click on the sensitized arrow and the initial screen of 24 lines is displayed.

The "Prev" and "Next" arrows maintain their same functionality regardless of the "Sorted By" option that is selected.

2.3.15.1.3 Sort Options. The Product Distribution Lines can be sorted by three options listed directly under the table. To the right of the words: Sorted By: are three options: Line, Type, and Status. Click on the option or the button to the left of the option and the table will be sorted in that

category. The button that is currently white is the option that is currently selected. The Line option lists the lines numerically by Line number (first column). The Type option lists the lines alphabetically by Type (second column). The Status option lists the lines alphabetically by Status (eighth column).

2.3.15.1.4 Line Control Buttons. The communication lines themselves can be modified by the four Line Control buttons at any time as this portion of the window is not password protected. The four Line Control buttons are: Reset, Disconnect, Connect, and Deselect. First select the line(s) from the table above by clicking once on the specific line, or click and drag across all the lines that need to be modified to highlight them. Then move the cursor to the desired Line Control button and click.

For single line selections, when clicking on the Reset, Disconnect, and Connect buttons, a warning_popup opens that states: “Do you want to Reset (Disconnect)(Connect) the selected line? Line Selected: X” where X is the line number. For multiple line selections, a warning_popup opens that states: “Do you want to Reset (Disconnect)(Connect) the selected A lines? Lines Selected: B, C, D, etc.” where A is the total number of lines selected and B, C, D, etc. are the specific line numbers.

Click on either Yes or No and the appropriate action will be taken.

Clicking on the Deselect button will deselect the lines in the above table that had been highlighted or selected and no other actions are taken on those lines. There is no warning_popup that opens with this button.

2.3.15.1.5 General Parameters Section. Once the password has been successfully entered, the General Parameters section of the window is now editable by the user. There are four categories that can be edited: the number of Retries to connect, length of time of Timeouts, Alarm threshold, and Warning threshold.

Retries is defined as the number of attempts to reconnect the line before it is marked as disconnected on the status display. The range of values that can be entered in the retries field is 1 - 999. Timeouts is defined as the number of seconds elapsed when the response to a communications command is considered overdue. The range of values that can be entered in the Timeouts field is 60-999 seconds. The Alarm (%) and Warning (%) values are Load Shedding adaptable parameters that are also changeable on the distributions line in the Load Shed Categories window. See [Figure 2-82](#).

Click in the box to the right of each category in order to perform an edit. If an entry outside any of the limits above is entered and then another block selected or the Return key pressed, a warning_popup opens that states: “The value you entered is invalid. It must be in the range AAA to BBB” where AAA and BBB are the range values listed above. Click on the Continue button and the user is returned to the General Parameters section for another entry.

2.3.15.1.6 Line Management Section. Once the password has been successfully entered, the Line Management section of the window is now editable by the user. This section contains the following information:

- Line # RPG Line Number
- Type DEDICATED or DIAL-IN
- Port Pswd The encrypted password that the line must match before it is allowed to connect
- Baud Rate The programmed baud rate of that line
- Comms Mgr # The comms number controlling that line
- PServer # The p_server number controlling that line
- Time Limit The maximum time that the line is allowed to stay connected before it automatically disconnects. The pull down menu provides the option to select the Class defined maximum connect time.
- Comms Option Yes/No The comms option is applicable only to those sites with satellite communication links.

To select the line to edit, take the cursor to the Product Distribution Lines table and scroll through the lines until the cursor arrives at the line that needs editing. Using the left mouse button, double click anywhere on the specific line. That line's information will appear in the Line Management section. The Line #, Comms Mgr #, and PServer # are filled in when the line is selected, but are not editable by the user. Under the Line/User Info section, the User ID and User Name are filled in when the line is selected, but are not editable by the user. Also, the Method block will only be editable for Class 4 lines and will remain grayed-out and desensitized for all others. Click on the other specific blocks that are editable (with a blue background) and enter in the new information.

2.3.15.1.6.1 Type. The Type block is a pull down menu with an arrow to the right of the block. The options available are Dedicated or Dial-in.

2.3.15.1.6.2 Port Identifier. The Port Identifier can be up to a four digit combination of numbers, letters, or characters.

2.3.15.1.6.3 Baud Rate. The Baud Rate currently functions in the range 9,600 to 128,800. It is possible to enter a seven digit value up to 9,999,999 which supports higher LAN based connections in the future. There are no warning_popups that appear for any entry in this field.

2.3.15.1.6.4 Time Limit. The Time Limit is the maximum time that the communication line is allowed to stay connected before it automatically disconnects. The Time Limit must be in the range 1 to 1440 minutes. Attempting to enter a value outside of this range will bring up a warning_popup that states: "The value you entered is invalid. It must be in the range 1 to 1440." Click on Continue and the user is returned to the Line Management section. Click on the arrow to the right of the editable field value and a pull down menu appears with the option: "Class". Click on Class, the class defined maximum connect time is inserted in the field, and the user returned to the edit field.

2.3.15.1.6.5 Comms Option. The Comms Option is a pull down menu with an arrow to the right of the block. The options available are Yes or No. This is applicable only to those sites with satellite communication links.

2.3.15.1.7 Line/User Info Section. Once the password has been successfully entered, the Line/User Info section of the window is now editable by the user. This section contains the following information:

- User ID The ID number of the user connected to that line
- User Name The name of the user connected to that line
- Class The class of user (RPGOP_50, RPGOP_90,1,2, or 4) that is connected to that line
- Method The method of distribution (for Class 4 users only) is four categories that consist of SSET, RSET, ITIM, or COMB. SSET is a single set of products, RSET is a single set of products repeatedly transmitted, ITIM is a one-time request of a limited set of products, and COMB is a combination of RSET and ITIM.

The User ID and User Name are filled in when the line is selected, and are not editable by the user. Also, the Method field will only be editable for class 4 lines and will remain grayed-out and desensitized for all others. Click on the other specific blocks that are editable and enter in the desired information.

2.3.15.1.7.1 Class. The Class type is a pull down menu with an arrow to the right of the block. The options available are RPGOP_50, RPGOP_90, 1, 2, or 4. If the line is dedicated, only classes which are allowed for dedicated lines are included in the pull down menu. If the line is dial-in, only classes which are allowed for dial-in lines are included in the pull down menu. When making changes to a lines configuration, save the changes before going to another line. Changes are not applied to that line until a user reconnects.

2.3.15.1.7.2 Method. The Method is a pull down menu with an arrow to the right of the block, and is only sensitized for a Class 4 user. The options available are SSET, RSET, ITIM, or COMB. SSET is a single set of products, RSET is a single set of products repeatedly transmitted, ITIM is a one-time request of a limited set of products, and COMB is a combination of RSET and ITIM.

2.3.15.1.8 Dial-in Users Section. The lower right hand corner of the window contains the Dial-in Users section. It has six columns, four of which can be edited in this section. For each dial-in user there is an entry in the Dial-in Users list. The class for each line can be defined from the Class pull down menu for each user. Changes do not have to be saved every time a class is changed to a different dial-in user. The operator can wait to save the changes until all editing is done in this list. After saving edits, changes are applied the next time a dial-in user connects. A brief description of each follows.

2.3.15.1.8.1 Paging Capability For Dial-in Lines. A paging capability is the first line of the Dial-in Users section. The list displays up to twenty records at a time. When sensitized, the left and right arrow buttons load in the next/previous page. Click on the appropriate arrow and the list will

be refreshed with the next/previous twenty lines. If the arrow buttons are grayed out and desensitized, then the operator is at the start/end of the list. Between the two arrows is a text line that describes the range of user IDs currently loaded and also the maximum user ID number. This text line is updated at the same time the list is refreshed.

2.3.15.1.8.2 User ID/Name. First is the User ID in numerical listing. This is followed with the corresponding user identification name. Neither is editable.

2.3.15.1.8.3 Pswd (Identifier). This is the up to six digit identifier of the user. This field is editable in this window.

2.3.15.1.8.4 Ovr. This is the toggle on/off override disconnect option in which the user may override the line disconnect time limit. This field is editable in this window.

2.3.15.1.8.5 T Limit. This is the time limit in minutes that the dial line will remain connected. The user can enter a specific value or select "Class" so the class defined maximum connect time is used. Since the maximum connect time can be defined for the line, class, and user, here is how the p_server determines the maximum connect time:

- Set the maximum connect time to the general limit (1440 minutes).
- If the user maximum connect time is defined by its class, then set the user maximum connect time to the class value.
- If the line maximum connect time is defined by its class, then set the line maximum connect time to the class value.
- Finally, the maximum connect time used for the port is the smallest of the three steps above.

The allowable range is 1 to 1440 minutes. Enter in a value within this range, press the Return key, and the value is accepted. If a value outside this range is entered and the Return key is pressed, a warning-popup appears that states: "The value you entered is invalid. It must be in the range 1 to 1440. Continue." Click on the Continue button and the operator is returned to the edit field to correct the entry.

Click on the arrow to the right of the editable field value and a pull down menu appears with the option: "Class". Click on Class, the class value is inserted in the field, and the user returned to the edit field.

2.3.15.1.8.6 Class. This is the pull down menu which allows a choice of either Class 2 or Class 4. This field is editable in this window.

2.3.15.1.8.7 Method. This field is for Class 4 lines only and is editable in this window when Class 4 is selected in the block above. The methods of distribution are: SSET, RSET, ITIM, or COMB. SSET is a single set of products, RSET is a single set of products repeatedly transmitted, ITIM is a one-time request of limited set of products, and COMB is a combination of RSET and ITIM.

2.3.15.1.8.8 Add Dial-in User Button. At the bottom left of the Dial-in User section is the Add Dial-in User button. Click on this button to pull up the Add Dial-in User window (Figure 2-73.).

Figure 2-73. Add Dial-In User

Click in the block to the right of User ID and enter in the ID number ranging from 1 to 9999. If an entry is too large, a warning_popup opens that states: “The value you entered is invalid. It must be in the range 1 - 9999.” Click on Continue and the user gets returned to the Add Dial-in User window.

The second entry is User Name. It can hold up to ten digits of letters, numbers, or characters.

The third entry is User Pswd. It can hold up to six digits of letters, numbers, or characters.

The fourth entry is Class. It has a pull down menu with an arrow to the right of the block. The options are either Class 2 or Class 4.

The fifth entry is Method. It has a pull down menu with an arrow to the right of the block. If the Class type is Class 2, then this entry is not sensitized. If the Class type is Class 4, then this entry turns blue and is editable. Options listed are SSET (1), RSET (2), ITIM (3), and COMB (4).

The sixth entry is Time Limit. It has a range of 1 to 1440 minutes. Enter in the numeric value of the time desired for the dial-in line to remain on-line.

The seventh entry is Override. This is a check in the box toggle switch. Click on the square box and a black check mark opens which means the user may override the line disconnect time limit. The absence of a check mark means no override.

Once the applicable entries have been made, move the cursor to the top of the Add Dial-in User window and click on the Apply button. There are several checks that are made before the data is accepted. If the user failed to enter a valid User ID, a warning_popup opens that states: “You must enter a valid user ID”. Click on the Continue button. If the user failed to enter a User Password, a warning_popup opens that states: “You must enter a password.” Click on the Continue button. If all entries are accepted, then the window disappears and the new Dial-in User line is listed in the Dial-in User table.

The Close button in the upper left hand corner closes the window without any action being taken on any line. Any edits made in any of the categories are lost unless the Apply button has been clicked.

2.3.15.1.8.9 Delete Dial-in User Button. The Delete Dial-in User button is in the lower right hand corner of the window, at the bottom of the Dial-in User section. This button is currently disabled.

2.3.15.1.9 Save Button. Once a change has been made to the window, the Save button becomes sensitized. Click on the Save button and a warning_popup opens that states: “You are about to overwrite the product distribution comms data. Do you want to continue?” Click on either Yes or No. If Yes is selected, the changes are saved and the Save button becomes grayed-out and desensitized. If No is selected, the changes are not saved but are still in the fields, and the Save button remains sensitized.

The editable changes for each line must be saved or discarded before a second line is selected. If the user accidentally selects another line before saving the changes, a warning_popup opens that states: “Do you want to save your changes?” Click on either Yes or No. Only then can the user go to another line to edit.

2.3.15.1.10 Undo Button. The Undo button undoes any changes that have been made since the last Save. There is no warning_popup as the changes are deleted and the user is returned to the Product Distribution Comms Status window. Once the changes have been deleted, the Undo and the Save buttons become grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator.

2.3.15.1.11 Baseline: Restore and Baseline: Update Buttons. The Baseline: Restore and Baseline: Update buttons are sensitized either after the password has been initially successfully entered or after changes have been saved or undone. While changes are being made and the window edited, the Baseline: Restore and Baseline: Update buttons remain grayed-out and desensitized.

Click on the Restore button and a warning_popup opens that states: “You are about to restore the product distribution comms data from baseline. Do you want to continue?” Click on either Yes or No. The appropriate actions are made and the user is returned to the Product Distribution Comms Status window.

Click on the Update button and a warning_popup opens that states: “You are about to update the product distribution comms data. Do you want to continue?” Click on either Yes or No. The

appropriate actions are made and the user is returned to the Product Distribution Comms Status window.

2.3.15.2 User Products. Click on the Products button in the USERS icon and, by default, the RPG Product Distribution Control window for Class 2 Users (Permission) opens ([Figure 2-74](#)). The top of the window contains the control boxes. In the upper left hand corner, the Close button closes the entire window (if no changes were made) and returns the user to the HCI. Three of the other four buttons are initially grayed out and desensitized (Save, Undo, and Baseline Update). The Baseline: Restore button is sensitized and available at any time for the operator to restore the window to the baseline values. When the password is successfully entered, the Base: Update button is sensitized. When changes are made to the data, the Save and Undo buttons become sensitized, the Baseline: Restore button remains sensitized, and the Baseline: Update button becomes grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized. The Baseline: Restore button remains sensitized, and the Baseline: Update buttons returns to the sensitized state only if the password had been previously entered.

The Class 2 Users (Permission) and Class 4 Users (Distribution) windows act differently than any other windows. These two windows are editable without a password since they are considered the current lists, not the default lists. The default lists are maintained by the baseline copy and changing them, using the Baseline: Update button, requires a ROC level password.

The operator can edit the working copy of both classes of data without a password, and can save or undo them at any time. The operator can also go back to the original default setting by simply selecting the Baseline: Restore button, again without needing a password.

RPG Product Distribution Control

Close Save Undo Baseline: Restore Update

User Class

☐ Class 2 Users [Permission] ☐ Class 4 Users [Distribution]

Set All Products

☐ Precipitation Mode (A) ☐ Clear Air Mode (B)

Filter Product List

Search: Sort by: ☐ Product Code ☐ Product MNE ☐ Description

MNE	Code	A	B	Freq	Elev/Cut(s)	Product Description
R	16	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	Base Reflectivity: 8 level/0.54 nm
R	17	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	Base Reflectivity: 8 level/1.1 nm
R	18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Reflectivity: 8 level/2.2 nm
R	19	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Reflectivity: 16 level/0.54 nm
R	20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	Base Reflectivity: 16 level/1.1 nm
R	21	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	Base Reflectivity: 16 level/2.2 nm
V	22	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	Base Velocity: 8 level/0.13 nm
V	23	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	Base Velocity: 8 level/0.27 nm
V	24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Velocity: 8 level/0.54 nm
V	25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Velocity: 16 level/0.13 nm
V	26	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Velocity: 16 level/0.27 nm
V	27	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Velocity: 16 level/0.54 nm
SW	28	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Spectrum Width: 8 level/0.13 nm
SW	29	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Spectrum Width: 8 level/0.27 nm
SW	30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Base Spectrum Width: 8 level/0.54 nm
USP	31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	User Selectable Storm Total Precipitation: 16 level/1.1 nm
DHR	32	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Digital Hybrid Scan Reflectivity: 256 level/0.54 nm
HSR	33	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Scan Reflectivity: 16 level/0.54 nm
CFC	34	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	Clutter Filter Control: 8 level/0.54 nm

Figure 2-74. RPG Product Distribution Control - Class 2 Users

2.3.15.2.1 Password. To edit the fields in the RPG Product Distribution Control windows or to restore the baseline values, no password is necessary. However, in order to update the baseline values, the ROC LOCA password must be successfully entered. Follow the procedures described in paragraph [2.2.4.1.7 Password Window](#).

2.3.15.2.2 User Class. By default, the Class 2 Users (permission) option appears on the window. This allows the editable fields of either Precipitation Mode A or B be selected for each product. Clicking on the Class 4 Users (Distribution) option in the second line (User class) of the window opens up the Class 4 Users (Distribution) option ([Figure 2-75](#)). Click on the button to the left of the title or on the title itself. The active option will have the button turn white and a red outline around the title.

RPG Product Distribution Control

Close Save Undo Baseline: Restore Update

User Class

☐ Class 2 Users [Permission] ☒ Class 4 Users [Distribution]

Filter Product List

Search: Sort by: ☐ Product Code ☐ Product MNE ☐ Description

MNE	Code	A	B	Freq	Elev/Cut(s)	Product Description
R	16	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Reflectivity: 8 level/0.54 mm
R	17	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Reflectivity: 8 level/1.1 mm
R	18	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Reflectivity: 8 level/2.2 mm
R	19	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input type="checkbox"/> <= 1.1	Base Reflectivity: 16 level/0.54 mm
R	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input type="checkbox"/> <= 1.1	Base Reflectivity: 16 level/1.1 mm
R	21	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Reflectivity: 16 level/2.2 mm
V	22	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Velocity: 8 level/0.13 mm
V	23	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Velocity: 8 level/0.27 mm
V	24	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Velocity: 8 level/0.54 mm
V	25	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Velocity: 16 level/0.13 mm
V	26	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Velocity: 16 level/0.27 mm
V	27	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input type="checkbox"/> <= 1.1	Base Velocity: 16 level/0.54 mm
SW	28	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Spectrum Width: 8 level/0.13 mm
SW	29	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Spectrum Width: 8 level/0.27 mm
SW	30	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= 0.0	Base Spectrum Width: 8 level/0.54 mm
USP	31	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= N/A	User Selectable Storm Total Precipitation: 16 level/1.1 mm
DHR	32	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= N/A	Digital Hybrid Scan Reflectivity: 256 level/0.54 mm
HSR	33	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= N/A	Scan Reflectivity: 16 level/0.54 mm
CFC	34	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/> <= N/A	Clutter Filter Control: 8 level/0.54 mm

This product has no extra parameters

Figure 2-75. RPG Product Distribution Control - Class 4 Users

With the Class 4 Users (Distribution) option selected, the operator can still change the Precipitation Mode A or B setting and can also now change the Frequency and Cut(s) of each product.

2.3.15.2.3 Set All Products. The second line of options is only available with the class 2 Users (Permission) window, and is used to set All Products. (Note that when Class 4 Users (Distribution) is selected, this portion of the window goes blank). If the box to the left of each option is blank, then neither option is selected. Click on the box or on the title itself, and a black check mark with white background opens in the box. This indicates that the related product list has been selected. Once the box has been checked, all the products listed in the table below will have the corresponding column A or B selected. To delete the entire list, click again on the box (or the title) and all the check marks in column A or B will be deleted. To return to the default values, click on the Baseline: Restore button on the top line of the window and answer Yes to the warning_popup window.

2.3.15.2.4 Filter Product List. The next set of options allows the user to filter the product list. This can be done either by the Search capability, or by the preset Sort by options of Product Code, Product MNE, or Description. If there are no characters entered in the Search box, then the filter process will determine which of the three fixed options have been selected. If Product Code is clicked or has a white button to the left of the title, the products will be sorted numerically by Product Code. If Product MNE or Description is clicked or has a white button to the left of the title, the product will be sorted in alphabetical order of either the MNE or the Product Description.

If there are characters (letter, numbers, or any other keystrokes) entered in the Search box and the Return key pressed, the filter process will refresh the table and list only those Products found with those characters, in either the MNE column or the Product Description column.

To return to a full display of products, clear out all the characters in the search box and press the Return key.

Once one of these four options has been selected, a red outline box surrounds the option, the button turns to white (for the three fixed options), and the filter or sort process takes place in the table below.

2.3.15.2.5 Product List. There are seven columns in the Product List at the bottom of the window. These are:

MNE	(Mnemonic of Product)
Code	(Numerical Number of Product)
A	(Weather Mode A)
B	(Weather Mode B)
Freq	(Frequency)
Elev/Cut(s)	(Elevation Selection and Cut Selection)
Product Description	(Product Description)

There is a scroll bar down the right hand side of the window to facilitate viewing the list of all the products.

The user has the option to select if the product(s) will be listed either under the Precipitation Mode (A), the Clear Air Mode (B), both of the modes, or neither of the modes. To select the product for a mode, click on the box under column A or B. The box turns to white and a black check mark opens. If both boxes are checked for a product, then it will appear in both modes. If neither box is checked, then it will not appear in either mode.

To change the frequency of the product, click on the Freq. block for the desired product, enter the desired numeric value, and press the Return key. The allowable range is 0 to 50. For example, an entry of 2 would mean that the product would be available every second volume scan. If a entry outside of this range is entered, a warning_popup appears that states: "You entered an invalid frequency of XXX. The valid range is 0 to 50." XXX is the value just entered by the operator. Click on the Continue box to return back to the same editable field.

For Class 2 Users, the Elev/Cut(s) column is N/A. The Elevation blue box is grayed out and desensitized. The <= symbols are grayed out and desensitized. No values can be entered in the Cut(s) column.

For Class 4 Users, the following apply:

- By default, the Elevation blue box is sensitized, the "<=" symbols are sensitized, and a 0.0 value will be in the Cut column.
- The Cuts column can have a range of values entered in the column. The range of values have two sets of limits and represents two different options:
Lowest Number of Elevation Cuts: -1 to -20 (Integer)
Specific Elevation Cuts: -1.0 to 45.0 (Decimal to the tenths)
- To select the generic lowest number of elevation cuts, enter a value in the range of -1 to -20. The negative integer number represents the number of cuts starting from the lowest elevation slice to be generated. Example: -4 would be the four lowest elevation slices to be generated. When this integer is selected, the Elevation blue box becomes desensitized and cannot be checked.
- To select a specific elevation cut, enter a value of -1.0 to 45.0. Note that this is a decimal to the tenth's digit. This entry does two things: It is matched up with the closest elevation slice and generates that slice. It also sensitizes the Elevation blue block with the <= sign.
 - If the Elevation blue block is NOT CHECKED, the decimal number (to the tenth's digit) represents the single elevation angle closest to that number that will be generated.
 - If the Elevation blue block is CHECKED, the decimal number (to the tenth's digit) indicates that ALL elevations from that elevation down to the lowest possible elevation slice will be generated.
- With the current VCPs (Build 5.0), the lowest possible elevation angle is 0.5. If the operator enters in any value from -1.0 to 0.5, the elevation slice selected will be 0.5. If future VCPs have negative elevation slices, then this option will select those slices.

2.3.15.2.6 Save Button. Once a change has been made to the window, the Save button becomes sensitized. Click on the Save button and a warning_popup opens that states: "Do you want to save your changes to the product distribution control data?" Click on either Yes or No. If Yes is selected, the changes are saved and the Save button becomes grayed-out and desensitized. If No is selected, the changes are not saved but are still in the fields and the Save button remains sensitized.

If only a weather mode or a frequency has been selected and a Save/yes has been attempted, another warning_popup appears that states: "An incomplete record was detected. You must define both a frequency and wx mode. Do you want to continue with the save and discard the incomplete records?" Click on either Yes or No. If Yes, the changes are saved except for the discarded incomplete records and the Save and Undo buttons are grayed-out and desensitized. If No, the operator is returned to the RPG Product Distribution Control window and the Save and Undo buttons are still sensitized.

2.3.15.2.7 Undo Button. The Undo button undoes any changes that have been made since the last Save. There is no warning_popup as the changes are deleted and the user is returned to the Product Distribution Control window. Once the changes have been deleted, the Undo and the Save buttons become grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator.

2.3.15.2.8 Baseline: Restore and Baseline: Update Buttons. The Baseline: Restore button is sensitized at all times. The Baseline: Update button is grayed-out and desensitized unless the ROC LOCA password has been successfully entered. Then it still remains grayed-out and desensitized until edits have been made and Saved. Then, and only then, will the Baseline: Update button be sensitized and functional.

Click on the Restore button and a warning_popup opens that states: "You are about to restore the product distribution control data to baseline values. Do you want to continue?" Click on either Yes or No. The appropriate actions are made and the user is returned to the Product Distribution Control window.

Click on the Update button and a warning_popup opens that states: "You are about to update the product distribution control data. Do you want to continue?" Click on either Yes or No. The appropriate actions are made and the user is returned to the Product Distribution Control window.

2.3.16 Text Strings.

Text Strings are located around the HCI in a variety of locations (Figure 2-76). They are described below by location and then by text description.

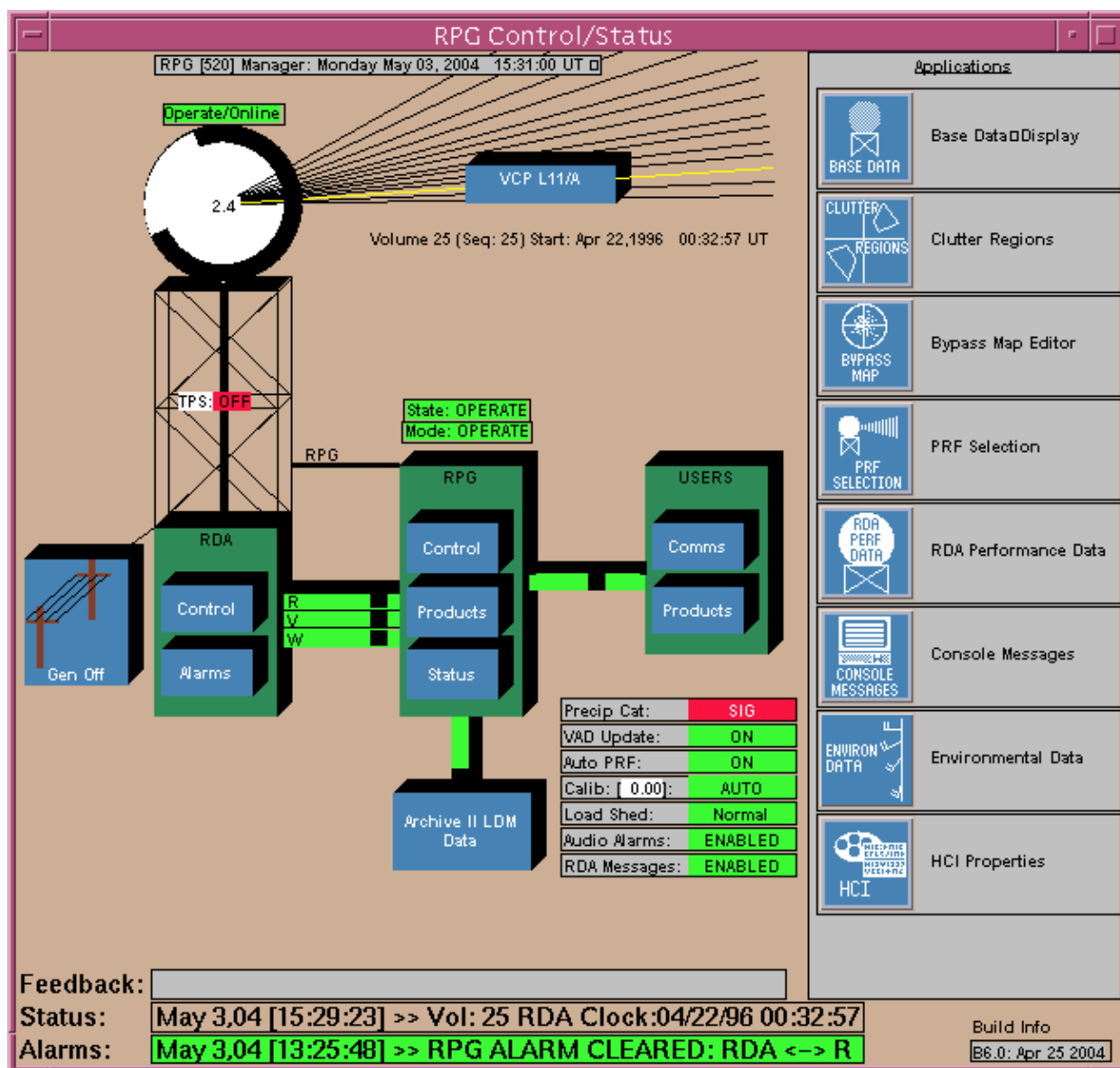


Figure 2-76. RPG Control/Status - NWS and DoD Sites

2.3.16.1 Top Center. RPG Site System Manager, Date, Time (Universal Greenwich Mean Time)

2.3.16.2 Top of Radome. The state and condition of the RDA are listed in the text string displayed over the top of the radome. The state is listed first, followed by the condition if appropriate. The state of the RDA will be listed as one of the following:

- Operate
- Standby
- Start-up
- Restart
- Offline Operate
- Unknown
- Playback

The condition will be listed second and is the determinate in the color coding of the text string. The condition and the associated background colors are:

- Online (Green)
- Operate (Green)
- Secondary (Green)
- Cmd Shutdown (Yellow)
- Maint Reqd (Yellow)
- Maint Mand (Orange)
- Inoperable (Red)
- Unknown (Red)

If the state and condition are both the same (i.e. Operate/Operate) only one of the words will be displayed in the text string.

2.3.16.3 Left of Radome. The RDA Alarms are identified by the three letter acronyms ARC, CTR, PED, RSP, USR, STL, WID, and XMT with a red background. These are explained in more detail in paragraph [2-3.7](#).

2.3.16.4 Center (near top) in Radial Lines in VCP Button. Current VCP.

2.3.16.5 Center (near top) under Radial Lines. Volume number, Sequence number, and the Start date/time of the volume scan. The Volume number will range from 1 to 80 and is used for easy reference and in the algorithms. The Sequence number (of the volume) will range from 1 to 9999 and is important internally to the RPG.

2.3.16.6 Center of Tower - TPS. If the site has a TPS installed and it is operational, there will be a text string appear in the center of the tower that states TPS OK. If the TPS is not operational, it will state: "TPS INOP.: If there is no TPS installed, there will be no text string.

2.3.16.7 Center Left: Gen Off or On Line. Click the text for the warning_popup to change the RDA power source.

2.3.16.8 Above Wideband Graphic. One of the three text messages (RDA, RPG, or Either) indicates which system currently has control of the RDA.

2.3.16.9 Center Top of RPG Icon. Top line describes the state of the RPG. Bottom line describes the Operational Mode of the RPG.

2.3.16.10 Bottom Lower Left. Three lines of information display the Feedback from the HCI, and the Status and Alarms from the RPG. These are discussed in more detail in the following subparagraphs.

2.3.16.10.1 Feedback Line. The Feedback line provides responses to inputs by the user throughout the windows in the HCI. It is not an editable field but is for information only. It will have a gray background.

2.3.16.10.2 Status Line. The Status line displays the most recent status message (that is not an Alarm or error related message) received in the RPG system log. The full listing of status messages is available for viewing by clicking on the Status button in the RPG icon in the center of the HCI.

2.3.16.10.3 Alarms Line. The Alarms line displays the most recent alarm or error-related message received on the RPG system log. The background color is color coded the same as the alarm coding: Red for Alarm, Yellow for Error, and Green for Alarm cleared. The full listing of alarms and errors is available for viewing by clicking on the Status button in the RPG control box in the center of the HCI.

2.3.16.11 Lower Right. Software Build Date.

2.3.16.12 Lower Right Under Users Icon. There are seven lines of information available. See [Figure 2-77](#).

In an FAA Redundant configuration, there will be an eighth line of information labeled Adapt: Match or Mismatch. This is described in paragraphs [2.3.16.12.8](#) and [2.7.3.2.4](#).

Precip Cat:	SIG
VAD Update:	ON
Auto PRF:	OFF
Calib: [-1.00]:	AUTO
Load Shed:	Normal
Audio Alarms:	ENABLED
RDA Messages:	ENABLED

Figure 2-77. Lower Right Under USERS Icon

2.3.16.12.1 Precip Cat (Precipitation Category). This line displays the current precipitation category as Significant (SIG in red background), Light (LIGHT in yellow background), or None (NONE in green background). Click on the category to open up the Precipitation Status window. See [Figure 2-78](#).

There are two functional buttons in the Precipitation Status window: a Close button and a Modify Parameters button. All of the rest of the information in the Precipitation Status window is non-editable. Click on the Close button in the upper left hand corner of the Precipitation Status window to close the entire window and return to the HCI. Click on the Modify Parameters button to open the Modify Precipitation Detection Parameters window.

Precipitation Status - (FAA:1)																																																																																									
Close		Modify Parameters		Time Until Clear Air: 0 minutes																																																																																					
Detection Algorithm Executed: Feb 22, 2001 - 16:22:32 UT																																																																																									
Category				Time Last Detected																																																																																					
Current:		LIGHT (2)		LIGHT (2):		Feb 22, 2001 - 16:22:32 UT																																																																																			
				SIGNIFICANT (1):		Feb 21, 2001 - 20:17:53 UT																																																																																			
<table border="1"> <thead> <tr> <th>Elevation Angle</th> <th>Rate (dBZ)</th> <th>Refl (dBZ)</th> <th>Thresh</th> <th>Area (km2)</th> <th>Thresh Detect</th> <th>Precip Category</th> <th>Met</th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>-2.0</td> <td>22.2</td> <td>120</td> <td>356</td> <td>LIGHT (2)</td> <td></td> <td></td> </tr> <tr> <td>0.5</td> <td>-2.0</td> <td>22.2</td> <td>120</td> <td>356</td> <td>LIGHT (2)</td> <td>YES</td> <td></td> </tr> <tr> <td>0.5</td> <td>4.0</td> <td>30.6</td> <td>160</td> <td>101</td> <td>SIGNIFICANT (1)</td> <td>NO</td> <td></td> </tr> <tr> <td>1.5</td> <td>-2.0</td> <td>22.2</td> <td>120</td> <td>0</td> <td>LIGHT (2)</td> <td>NO</td> <td></td> </tr> <tr> <td>1.5</td> <td>4.0</td> <td>30.6</td> <td>160</td> <td>0</td> <td>SIGNIFICANT (1)</td> <td>NO</td> <td></td> </tr> <tr> <td>2.4</td> <td>-2.0</td> <td>22.2</td> <td>100</td> <td>1</td> <td>LIGHT (2)</td> <td>NO</td> <td></td> </tr> <tr> <td>2.4</td> <td>4.0</td> <td>30.6</td> <td>160</td> <td>0</td> <td>SIGNIFICANT (1)</td> <td>NO</td> <td></td> </tr> <tr> <td>3.4</td> <td>-2.0</td> <td>22.2</td> <td>100</td> <td>0</td> <td>LIGHT (2)</td> <td>NO</td> <td></td> </tr> <tr> <td>3.4</td> <td>4.0</td> <td>30.6</td> <td>160</td> <td>0</td> <td>SIGNIFICANT (1)</td> <td>NO</td> <td></td> </tr> </tbody> </table>										Elevation Angle	Rate (dBZ)	Refl (dBZ)	Thresh	Area (km2)	Thresh Detect	Precip Category	Met	0.5	-2.0	22.2	120	356	LIGHT (2)			0.5	-2.0	22.2	120	356	LIGHT (2)	YES		0.5	4.0	30.6	160	101	SIGNIFICANT (1)	NO		1.5	-2.0	22.2	120	0	LIGHT (2)	NO		1.5	4.0	30.6	160	0	SIGNIFICANT (1)	NO		2.4	-2.0	22.2	100	1	LIGHT (2)	NO		2.4	4.0	30.6	160	0	SIGNIFICANT (1)	NO		3.4	-2.0	22.2	100	0	LIGHT (2)	NO		3.4	4.0	30.6	160	0	SIGNIFICANT (1)	NO	
Elevation Angle	Rate (dBZ)	Refl (dBZ)	Thresh	Area (km2)	Thresh Detect	Precip Category	Met																																																																																		
0.5	-2.0	22.2	120	356	LIGHT (2)																																																																																				
0.5	-2.0	22.2	120	356	LIGHT (2)	YES																																																																																			
0.5	4.0	30.6	160	101	SIGNIFICANT (1)	NO																																																																																			
1.5	-2.0	22.2	120	0	LIGHT (2)	NO																																																																																			
1.5	4.0	30.6	160	0	SIGNIFICANT (1)	NO																																																																																			
2.4	-2.0	22.2	100	1	LIGHT (2)	NO																																																																																			
2.4	4.0	30.6	160	0	SIGNIFICANT (1)	NO																																																																																			
3.4	-2.0	22.2	100	0	LIGHT (2)	NO																																																																																			
3.4	4.0	30.6	160	0	SIGNIFICANT (1)	NO																																																																																			
NOTE: Threshold Area = Nominal Clutter Area + Precipitation Area																																																																																									

Figure 2-78. Precipitation Status

2.3.16.12.1.1 Modify Precipitation Detection Parameters. To change the parameters that are used to detect precipitation, click on the Modify Parameter button, in the Precipitation Status Window. The Modify Precipitation Detection Parameters window opens. See [Figure 2-79](#). The top line has five buttons and a padlock for the password protected entries. The Close button closes the window and returns the user to the Precipitation Status window. The other four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially grayed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized.

Tilt Domain	Precip Rate Thrsh (dBR)	Nominal Clutter Area (Km2)	Precip Area Thrsh (Km2)	Precip Cat	
0.0	2.0	-2.0	100	20	LIGHT (2)
0.0	4.0	4.0	150	10	SIGNIFICANT (1)
2.0	4.0	-2.0	80	20	LIGHT (2)

To edit, select an item from the table followed by Modify or Delete

Figure 2-79. Modify Precipitation Detection Parameters

To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#).

The user must now go to the second line in the window under the Edit title where there are three buttons: Add, Modify, or Delete. Click on the appropriate button for the changes that are to be made, and a separate window opens. The editable fields in each of these three windows are now highlighted with a light blue background and can be edited.

2.3.16.12.1.1.1 Add Precipitation Table Item. This item is editable only at the ROC LOCA. Click on the Add button and the Add Precipitation Table Item window opens. See [Figure 2-80](#). The Close button is sensitized and, when clicked, returns the user to the Modify Precipitation Detection Parameters window. The Apply button is grayed-out and desensitized until an input has

been made in the table. There are six categories of information that may be edited. The six categories and their ranges of authorized values are:

- Minimum Elevation Angle (-1 Degree to + 45 Degrees)
- Maximum Elevation Angle (-1 Degree to + 45 Degrees)
- Precipitation Rate Threshold (-30 to + 50 dBR Threshold)
- Nominal Clutter Area (0 to 80000 km²)
- Precipitation Area Threshold (0 to 80000 km²)
- Precipitation Category (None - 0 - white; Significant - 1 - red; Light - 2 - yellow)

Add Precipitation Table Item		
Close Apply		
Min Elevation Angle	(-1.0 - 45.0 deg)	0.0
Max Elevation Angle	(-1.0 - 45.0 deg)	0.0
Precip Rate Thrshld	(-30.0 - 50.0 dBR)	0.0
Nominal Clutter Area	(0 - 80000 km2)	0
Precip Area Thrshld	(0 - 80000 km2)	0
Precipitation Category	NONE	(0)

Figure 2-80. Add Precipitation Table Item

If a numerical input is made that is outside the respective ranges and the Return key is pressed or mouse clicked elsewhere, a warning_popup opens that states: “You entered an invalid value of XXX. The valid range is AA to BB.”, where XXX is the value just entered, AA is the lowest value the user can enter, BB is the highest value the user can enter. Click on Continue to restore the original value and return to the Add Precipitation Table Item window. If a correct entry has been made, move the cursor and click to the next category. For the Precipitation Category, click on the category box and the three options will scroll in sequence. Continue to click until the desired category is listed.

Once all the categories have been correctly entered, move the cursor to the Apply button in the upper left hand corner and click. This enters the information into the Modify Precipitation Detec-

tion Parameters Table and determines the Precipitation Category that is displayed on the bottom line of the Add Precipitation Table Item window. To close this window, move the cursor to the Close button in the upper left hand corner and click.

2.3.16.12.1.1.2 Modify Precipitation Table Item. To modify a particular line in the Modify Precipitation Detection Parameters window, click on any item in that line. Then, click on the Modify button. The Modify Precipitation Table Item window opens with the current values for that line being displayed. See [Figure 2-81](#).

NOTE

The Modify Precipitation Table Item window will not open if there is an Add Precipitation Table Item window open. Likewise, the Add Precipitation Table Item window will not open if the operator has already opened a Modify Precipitation Table Item window. Only one or the other can be opened at any one time.

The Close button is sensitized and, when clicked, returns the user to the Modify Precipitation Detection Parameters window. The Apply button is grayed-out and desensitized until an input has been made in the table, then the button becomes sensitized. There are six categories of information that can be modified. The six categories and their ranges of authorized values are:

- Minimum Elevation Angle (-1 Degree to + 45 Degrees)
- Maximum Elevation Angle (-1 Degree to + 45 Degrees)
- Precipitation Rate Threshold (-30 to + 50 dBR Threshold)
- Nominal Clutter Area (0 to 80000 km²)
- Precipitation Area Threshold (0 to 80000 km²)
- Precipitation Category (None - 0 - white; Significant - 1 - red; Light - 2 - yellow)

Modify Precipitation Table Item		
Close Apply		
Min Elevation Angle	(-1.0 - 45.0 deg)	0.0
Max Elevation Angle	(-1.0 - 45.0 deg)	2.0
Precip Rate Thrshld	(-30.0 - 50.0 dBR)	-2.0
Nominal Clutter Area	(0 - 80000 km2)	100
Precip Area Thrshld	(0 - 80000 km2)	20
Precipitation Category	LIGHT (2)	

Figure 2-81. Modify Precipitation Table Item

If a numerical input is made that is outside these respective ranges and the Return key is pressed, a warning_popup opens that states: “You entered an invalid value of XXX. The valid range is AA to BB.” (XXX is the value just entered, AA is the lowest value the user can enter, BB is the highest value the user can enter). Click on Continue, the original value will be restored, and the user is returned to the Modify Precipitation Table Item. If a correct entry has been made, move the cursor and click to the next category. For the Precipitation Category, click on the category box and the three options will scroll in sequence. Continue to click until the desired category is listed.

Once all the categories have been correctly entered, move the cursor to the Apply button in the upper left hand corner and click. This enters the information into the Modify Precipitation Detection Parameters Table. To close this window, move the cursor to the Close button in the upper left hand corner and click. If the Close button has been clicked before the Apply button, then the changes are not made to the table and the user is returned to the Modify Precipitation Detection Parameters window.

2.3.16.12.1.1.3 Delete Precipitation Table. This item is editable only at the ROC LOCA. To delete a line in the Precipitation table, first click on any value in that line. Then click on the Delete button. A warning_popup appears that states: "You are about to delete the highlighted precipitation detection record. Do you want to continue?" Click on either Yes or No. If Yes, the line is deleted and the user is returned to the Modify Precipitation Detection Parameters window. The Save and Undo buttons are now sensitized. If No, nothing is deleted and the user returned to the Modify Precipitation Detection Parameters window.

2.3.16.12.1.1.4 Save and Undo Buttons. Once changes have been added, modified, or deleted, the Save and Undo buttons are sensitized. Click on the Save button to save the changes made to the Precipitation categories and tables. A warning_popup opens that states: “Do you want to save the edits you made to the Precipitation Detection Parameters data?” Click on either Yes or No. If Yes, the changes are saved and the user is returned to the Modify Precipitation Detection Parameters window. If No, the changes are not saved and the user is returned to the Modify Precipitation Detection Parameters window. Clicking on the Close button on the Precipitation Status window will display a warning_popup stating: “You modified Precipitation Detection Parameters data without saving it. Do you want to save it?” Selecting Yes will save the changes and return you to the Precipitation Status window. Selecting No does not save the changes and returns the user to the Precipitation Status window.

Click on the Undo button to undo the changes that were made. There is no warning-popup and the user is returned to the Modify Precipitation Detection Parameters window. The Undo and Save buttons become grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator.

If the user clicks on the Close button before the Save or Undo button, a warning_popup opens that states: “You modified Precipitation Detection Parameters data without saving it. Do you want to save it?” Click on either Yes or No. If Yes, the changes are saved and the user is returned to the Precipitation Status window. If No, the changes are not saved and the user is returned to the Precipitation Status window.

After the changes have been saved, they go into effect at the beginning of the next volume scan.

2.3.16.12.1.1.5 Baseline: Restore and Baseline: Update. The Baseline: Restore and Baseline: Update buttons are sensitized either after the password has been initially successfully entered or after changes have been saved or undone. While changes are being made and the window edited, the Baseline: Restore and Baseline: Update buttons remain grayed-out and desensitized.

Click on the Baseline: Restore button to restore all values in that window back to the baseline values. A warning_popup opens that states: “You are about to replace precip detection adaptation data with baseline values. Do you want to continue?” Click on either Yes or No. If Yes, the values are restored to the baseline values and the user is returned to the Modify Precipitation Detection Parameters window. If No, then no changes are made and the user is returned to the Modify Precipitation Detection Parameters window.

Click on the Baseline: Update button to modify the baseline values to include changes that have been made. A warning_popup opens that states: “You are about to update baseline precip detection data. Do you want to continue?” Click on either Yes or No. If Yes, the baseline values are changed and the user is returned to the Modify Precipitation Detection Parameters window. If No, then no changes are made and the user is returned to the Modify Precipitation Detection Parameters window.

2.3.16.12.1.2 Precipitation Status Window Information. The rest of the Precipitation Status window provides information to the operator. None of the fields are editable by the user.

2.3.16.12.1.2.1 Time Until Clear Air. This is the time remaining until Clear Air, which starts 60 minutes after Significant Precipitation (Category 1) was last detected.

2.3.16.12.1.2.2 Detection Algorithm Executed. This is the date/time of the most recent execution (start) of the Precipitation Detection Algorithm.

2.3.16.12.1.2.3 Category Current:. The Category Current: field is the category of precipitation that is currently being detected by the algorithm.

2.3.16.12.1.2.4 Time Last Detected: Light and Significant. Time Last Detected: Light (2) is the date/time that Light precipitation was detected. Time Last Detected: Significant (1) is the date/time that Significant precipitation was detected.

2.3.16.12.1.2.5 Threshold and Detection Data. This is the large box area covering most of the Precipitation Status window. The displayed precipitation category field is determined by the Table Threshold and Detection Data. The criteria are:

- If detected precipitation category field is 1 (Significant), then the detection and threshold data that met the category 1 criterion is displayed. If none, then the detection and threshold data with the largest detected area that met the category 2 (Light) is displayed. If currently no detection, then “DATA NOT AVAIL-

ABLE” is displayed.

- If detection precipitation category field is 2 (Light), then the detection and threshold data with the largest detected area that met the category 2 criterion is displayed.
- If detected precipitation category field is 0 (None), then the category 1 criterion and threshold data for the largest detected area is displayed.
- Only the three most significant threshold data lines will be displayed. There may be other criteria lines in the Modify Precipitation Detection Parameters window, but the lower category lines will not be displayed in this table.

The following columns of information are displayed:

- Elevation Angle: Radar elevation angle in degrees for which a row in the Precipitation threshold table applies.
- Rate (dBR) Thresh: Minimum rainfall rate (in dBR) for a Reflectivity bin to count toward the precipitation area for a particular row in the related Precipitation Detection window. (Equivalent to the Reflectivity (in dBZ)).
- Refl (dBZ) Thresh: Minimum reflectivity (in dBZ) for a Reflectivity bin to count toward the precipitation area for particular row in the related Precipitation Detection window. (Equivalent to the rainfall rate (in dBR)).
- Area (km2) Thresh: Minimum area (in km squared) covered by precipitation in the Precipitation Threshold Table. (Note that the threshold area will consist of the nominal clutter area and the precipitation area.)
- Area (km2) Detect: The actual precipitation area detected (in km squared).
- Precip Category: The code for the current precipitation category:
 - 0 - No Precipitation
 - 1 - Significant Precipitation
 - 2 - Light Precipitation
- Precip Met: Either Yes or No.

2.3.16.12.2 VAD Update. This is the on/off toggle for the Auto VAD Update function. It displays either the word ON with a green background or the word OFF with a yellow background. The user can initiate a change of this selection by clicking on the word ON or OFF. A warning_popup opens that asks: “Do you want to disable (enable) VAD update?” Click either Yes or No. The change will be made and the user returned to the HCI.

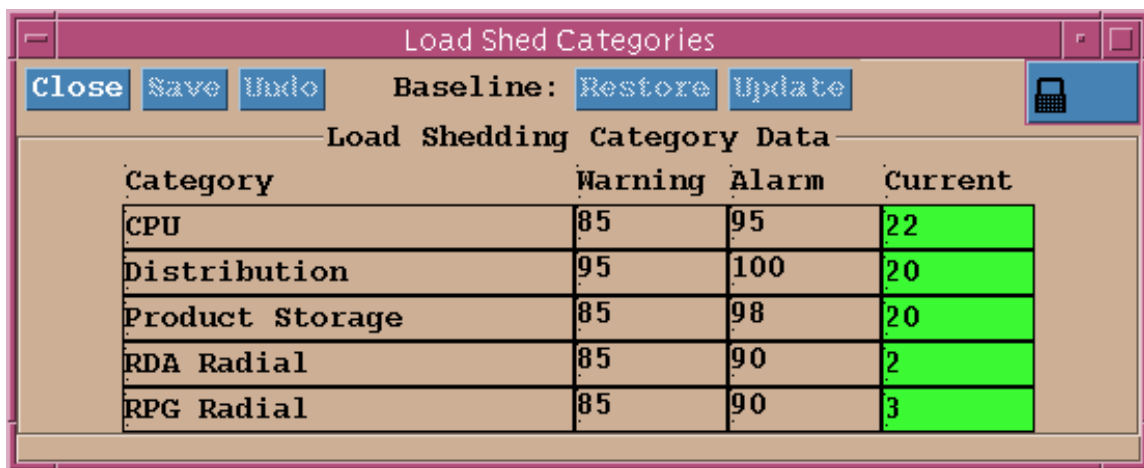
2.3.16.12.3 Auto PRF. This is the on/off toggle for the Auto PRF function. It displays either the word “ON” with a green background or the word “OFF” with a yellow background. The user can initiate a change of this selection by clicking on the word ON or OFF. A warning_popup opens that asks: “You are about to disable (enable) the Auto PRF function. Do you want to continue?” Click either the Yes or No block. The change will be made and the user returned to the HCI.

There is one situation where the user can not enable the Auto PRF. If the reflectivity moment is not enabled and the user attempts to toggle the Auto PRF on, a warning_popup will appear that states: “You cannot enable Auto PRF when reflectivity is not enabled.” Click on Continue and the user is returned to the HCI.

2.3.16.12.4 Calib (Value) AUTO/MANUAL. This displays the current Delta System calibration value of the RDA in 0.25 dBZ increments when Auto calibration is on (AUTO with a green background) or shows the manually selected calibration value when auto calibration is off (MANUAL with an orange background). When the wideband line is connected, clicking on the word AUTO opens the Reflectivity Calibration window. The user can select a manual calibration value in this window. Click on the word MANUAL to initiate a change back to Auto Calibration. See paragraph 2.3.10.1.10.2, for more detail on how to use the Reflectivity Calibration window.

2.3.16.12.5 Load Shed. This line displays the status of various Load Shed categories with either the word Normal with a green background, the word Warning with a yellow background, or the word Alarm with a red background. Click on any of these three words to open the Load Shed Categories window. See Figure 2-82. This window displays the thresholds for the warning and alarm levels as well as the current levels for all of the load shed categories. If the user has opened this window because a load shed alarm has occurred, a quick glance at the window will reveal which category is the cause. The current value is highlighted to match the threshold level. If the current value is at the alarm level, it will be highlighted in red. If the current value is at the warning level and up to the alarm level, it will be highlighted in yellow. If the current value is below the warning level, it will be highlighted in green. The Load Shed categories are as follows:

- CPU
- Distribution
- Product Storage
- RDA Radial
- RPG Radial



Category	Warning	Alarm	Current
CPU	85	95	22
Distribution	95	100	20
Product Storage	85	98	20
RDA Radial	85	90	2
RPG Radial	85	90	3

Figure 2-82. Load Shed Categories

The top of the window contains several buttons. In the upper left hand corner, the Close button closes the entire window (if no changes were made) and returns the user to the HCI. The other four buttons: Save, Undo, Baseline: Restore, and Baseline: Update are initially grayed-out and desensitized. This window is now editable only at the ROC LOCA. Should the case arise to change ROC LOCA parameters, upon the password being successfully entered, the Baseline: Restore and Baseline: Update buttons will become sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized.

To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#). Remember, this item is editable only at the ROC LOCA

Once the password has successfully been entered, two of the control buttons in the center top of the window become sensitized and are no longer grayed-out. These are the Baseline: Restore and Baseline: Update buttons. Clicking on the Restore button brings up a warning_popup that states: "You are about to restore the load shed adaptation data to baseline values. Do you want to continue?" Click on the Yes button and the figures are reset to the baseline values. Click on the No button and the window disappears without any changes and returns the user to the Load Shed Categories window. Clicking on the Update button brings up a warning_popup window that states: "You are about to replace the baseline load shed threshold data values. Do you want to continue?" Click on the Yes button and the baseline values are reset to the values currently showing on the Load Shed Categories window. Click on the No button and the window disappears without any changes to the baseline and returns the user to the Load Shed Categories window.

To change parameters in the Warning column, click on the desired block and enter the value desired. The allowable range is from 0 to the Alarm Value. If the user enters a value too large, a warning_popup opens that states "You entered an invalid value of XXX. The valid range is 0 to AAA". (XXX is the value entered by the user. AAA is the value of that particular category's Alarm Value.) Click on Continue to return to the Load Shed Categories window. The invalid entry is deleted and the previous value restored to that block.

To change parameters in the Alarm column, click on the desired block and enter the value desired. The allowable range is from the Warning value to 100. If the user enters a value outside that range, a warning_popup opens that states "You entered an invalid value of XXX. The valid range is BBB to 100." (XXX is the value entered by the user. BBB is the value of that particular category's Warning value.) Click on Continue to return to the Load Shed Categories window. The invalid entry is deleted and the previous value restored to that block.

Once a change has been successfully made to the Warning or Alarm columns, the Save and Undo buttons in the upper left corner of the window become sensitized. At the same time, the Baseline: Restore and Baseline: Update buttons become desensitized. Clicking on the Save button brings up a warning_popup that states: "Do you want to save your changes?" Click on the Yes button to save the changes, or click on the No button to not save the changes. Clicking on the Undo button removes all the changes that were made and the window is restored to its previous values. There

is no warning_popup window with the Undo block. The Undo and Save buttons become grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized and available to the operator.

If at any time the red open padlock is clicked, a warning_popup opens that states: “Do you want to save your changes?” Click on the Yes button to save the changes, or click on the No button and the changes will not be saved. The user is then returned to the Load Shed Categories window and the padlock turns to black and is locked.

2.3.16.12.6 Audio Alarms. Click on the right hand side of the text line to toggle the audio alarm between ENABLED with a green background and DISABLED with a yellow background. This toggles the audio alarms on or off.

2.3.16.12.7 RDA Messages. Click on the right hand side of the text line to toggle the RDA messages between ENABLED with a green background to DISABLED with a yellow background. This toggles the RDA messages on or off.

2.3.16.12.8 FAA Redundant Adaptable Parameters Match Adapt Times. In an FAA Redundant configuration, there will be an eighth text line that states Adapt Times: MATCH (with a green background) or MISMATCH (with a red background). If at the HCI of the non-controlling channel, nothing will happen when the MATCH/MISMATCH button is clicked. If at the HCI of the controlling channel, the cursor will turn to a pointing hand over the word MATCH or MISMATCH.

Clicking on either the MATCH or MISMATCH title brings up a warning_popup that states: “Are you sure you want to force an update of adaptation data on the other channel?” Click on either Yes or No. If Yes, the older adaptation data will be updated and match the newer adaptation data, and the text string will change to MATCH with a green background. If No, the user will be returned to the HCI. This text line is discussed further in section [2.7.3.2.4](#).

NOTES

In Build 6.0, the Mismatch feature does NOT update adaptation data in the Algorithms or Selectable Parameters categories on the inactive channel. It DOES update the Notch Width Map, Bypass Map, Clutter Suppression Regions, Edited Bypass Map, Alerting Adaptation Data, Load Shed Adaptation Data, Background Map Associations for the HCI, Product Generation Tables (Baseline and Current), and User Profiles.

Forcing an update by clicking on the MATCH/MISMATCH button will only match up the above-listed adaptation data, and respond by showing "MATCH" in the Adapt Times field on the HCI. The adaptation data for the Algorithms and Selectable Parameters categories are not matched at this point, and must be edited manually on both channels to make the channels match.

2.3.17 Applications Icons.

The right side of the RPG Status/Control window is devoted to activating various applications that are frequently used in the everyday operations and maintenance of the system. See [Figure 2-83](#). These applications can be accessed primarily by clicking on the square icon button. A red outline will appear around the icon, and the associated window will open for that particular application. The applications available are:

- Base Data Display
- Clutter Regions
- Bypass Map Editor
- PRF Selection
- RDA Performance Data
- Console Messages
- Environmental Data
- HCI Properties

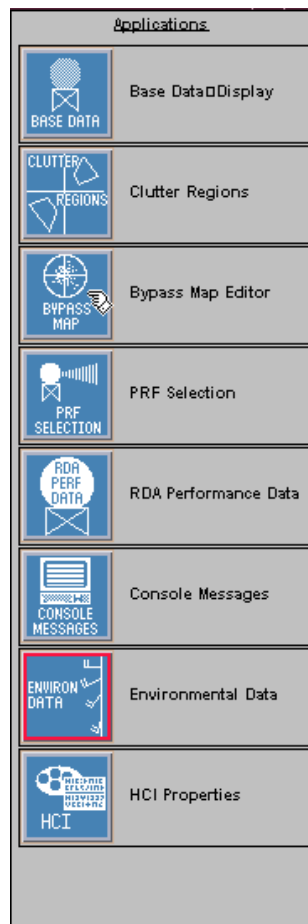


Figure 2-83. Applications Icons

The applications that deal primarily with operational considerations will be described in complete detail in Chapter 3. These are: Clutter Regions, Bypass Map Editor, PRF Selection, and Environmental Data. The other applications that are strictly functional are described below.

2.3.17.1 Base Data Display. Clicking on the Base Data Display icon brings up the RPG Base Data Display window (Figure 2-84). By default, the contents of the Base Data window are updated as new base data are ingested into the RPG. The options on displaying the data are grouped down the left side of the window. The options are: Elevation, Data Range, Filter, Moment, Grid, Map, and Mode. Click on the Close button in the upper left hand corner to close the window and return the user to the HCI.

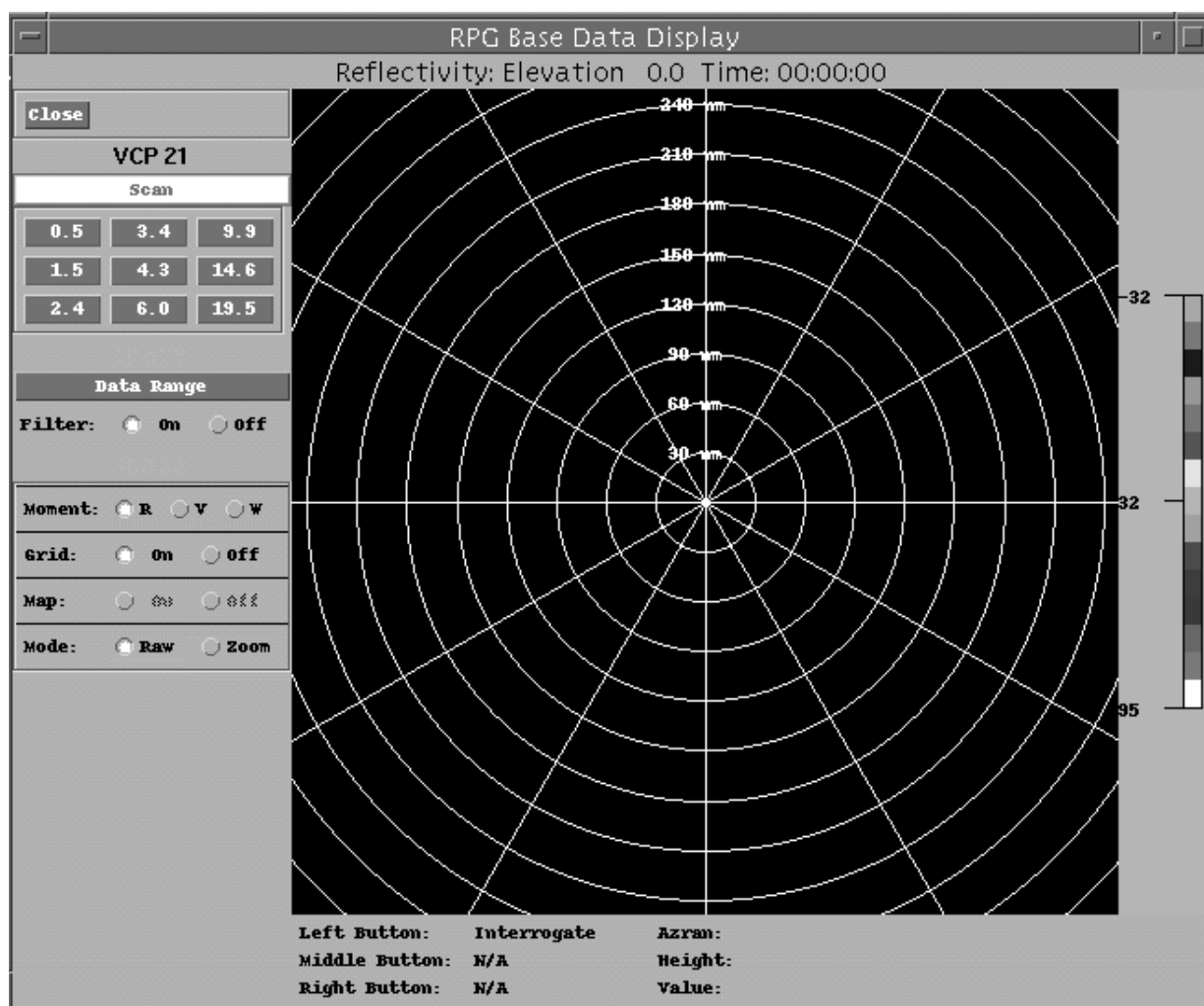


Figure 2-84. RPG Base Data Display

2.3.17.1.1 Scan and Elevation Buttons. Data displayed in this window is not available at a Distant MSCF (DoD and FAA) by design because of the limited bandwidth. The data can only be displayed at a Local MSCF or the RPG Terminal in the RPG cabinet.

The top button, Scan, places the Base Data Display window in dynamic mode. In this mode, the display is updated as each new radial is ingested from the RDA. When a new elevation scan is detected, data from the old elevation scan is cleared.

For VCP 121, the scan feature will not operate the same for all the elevation cuts.

- For elevations 0.5 and 1.5, the scan functions constantly.
- For elevations 2.4, 3.4, and 4.3, the MPDA does not dealias "on-the-fly". The de-aliased output is not available until after the last of the redundant scans is collected. Therefore the base data display waits for the data to become available, and the data will appear all at once, at the end of the particular scan.
- At elevation 6.0, the VCP goes from a redundant scan mode to a single scan mode. Thus the 4.3 elevation cut will only be visible for the period between the end of the 4.3 scan and the beginning of the 6.0 scan (roughly a few seconds at most.)
- Above elevations 6.0, the scan functions constantly.

The rest of the Elevation buttons are used to select the newest previously ingested elevation scan for display and place the RPG Base Data Display window in static mode. In static mode, new radials are ingested from the RDA but are not displayed. The static elevation buttons match the elevation angles in the current VCP.

2.3.17.1.2 Data Range Button. Click on the Data Range button in the middle of the left hand column and the Set Data Range window opens. See [Figure 2-85](#). There are six categories that are available for user to set. They are: Minimum Reflectivity (-32 dBZ to 95 dBZ), Maximum Reflectivity (-32 dBZ to 95 dBZ), Minimum Velocity (-246 kts to 244 kts), Maximum Velocity (-246 kts to 244 kts) Minimum Spectrum Width (0 kts to 20 kts), and Maximum Spectrum Width (0 kts to 20 kts).

The 'Set Data Range' dialog box is shown with the following fields and values:

Category	Minimum Value	Maximum Value
Minimum Reflectivity (dBZ)	-32	95
Maximum Reflectivity (dBZ)	-32	95
Minimum Velocity (kts)	-246	244
Maximum Velocity (kts)	-246	244
Minimum Spectrum Width (kts)	0	20
Maximum Spectrum Width (kts)	0	20

At the bottom of the dialog are two buttons: 'Close' and 'Apply'.

Figure 2-85. Set Data Range

Using the left mouse button, click, hold, and drag the horizontal sliding bar to the desired value for each field. The user can also use the arrow keys to move the cursor horizontally once the cursor has been placed on the sliding bar. There are checks with each pair of categories: minimum will always be less than the maximum and the maximum will always be more than the minimum. If the user accidentally slides one bar's value across its paired category, the bar will spring back to the nearest allowable value.

There are two control buttons, Close and Apply, on the left bottom of the window. Clicking on the Close button closes the window and sends the user back to the RPG Data Display window. Any changes made are still in the Set Data Range window but they have not been applied to the RPG Base Data Display window. Click on the Apply button and the changes are made in the Base

Data Display but the user remains in the Set Data Range window. There are no warning_popups that appear with this window.

2.3.17.1.3 Filter Buttons. The Filter On/Off button allows the operator to filter the data being displayed. When the filter is selected On, any data less than the lowest value on the scale or higher than the highest value on the scale will not be displayed. When the filter is selected Off, then all data less than the lowest value or higher than the highest value will be displayed in those appropriate colors. This filter works for all three of the moments and for all selected scales.

2.3.17.1.4 Moment Buttons. The Moment buttons are displayed along the middle left of the RPG Base Data Display window. They are used to change the currently displayed data through the various moments of reflectivity (R), velocity (V), and spectrum width (W). The moment currently displayed in the window will have the respective button to the immediate left of the R, V, or W colored white. Click on the desired moment's letter or its button and the display will be updated with the new selection.

2.3.17.1.5 Grid Buttons. The concentric circular grid is turned either On or Off with a click over the desired button or the desired On/Off title. The white dot indicates which option is currently selected.

2.3.17.1.6 Map Buttons. The On/Off Map overlays are either turned On or Off with a click over the desired button or on the desired On/Off title. The white dot indicates which option is currently functional. The default map extends to 240 nm. There are no maps that are presently available. There is no requirement at this time for this feature to be implemented, but the buttons are in place, desensitized, and grayed out.

2.3.17.1.7 Raw/Zoom Mode Buttons. The Raw/Zoom Mode buttons toggle between Raw Mode and Zoom Mode. In Zoom Mode, clicking anywhere in the RPG Base Data Display window places the clicked point is the center of the RPG Base Data Display window. The left button zooms in and the right button zooms out. In Raw Mode, if the Clutter Region Editor is not open, the left button click causes the data at the specified point to be displayed underneath the elevation buttons. If the Clutter Region Editor is opened and the base data window is in raw mode, dragging the left mouse button creates clutter suppression regions. Zoom mode operation is allowed when the Clutter Region Editor is opened.

2.3.17.2 Clutter Regions. Clicking on this icon opens the Clutter Regions Editor windows. It provides a window in which the user can define the attributes of clutter suppression regions. It is described in complete detail in Chapter 3.

2.3.17.3 Bypass Map Editor. Clicking on this icon opens the Clutter Bypass Map Editor window. It provides a window in which the user can define the areas to bypass the clutter. It is described in complete detail in Chapter 3.

2.3.17.4 PRF Selection. Clicking on this icon opens the PRF Selection (Modify Current VCP) window. It provides a window in which the user can modify the PRF selection. It is described in complete detail in Chapter 3.

2.3.17.5 RDA Performance Data. Clicking on the RDA Perf (Performance) Data icon opens the RDA Performance Data window. See [Figure 2-86](#). There are nine categories of data that are represented by an associated button. The Close button in the upper left hand corner closes this window and returns the user to the HCI. The user can see in the Last Update: field when the RDA performance data was last updated. If there is no connection with the RDA, the field will read Data Not Available. Clicking on any of the nine categories will bring up that associated window.

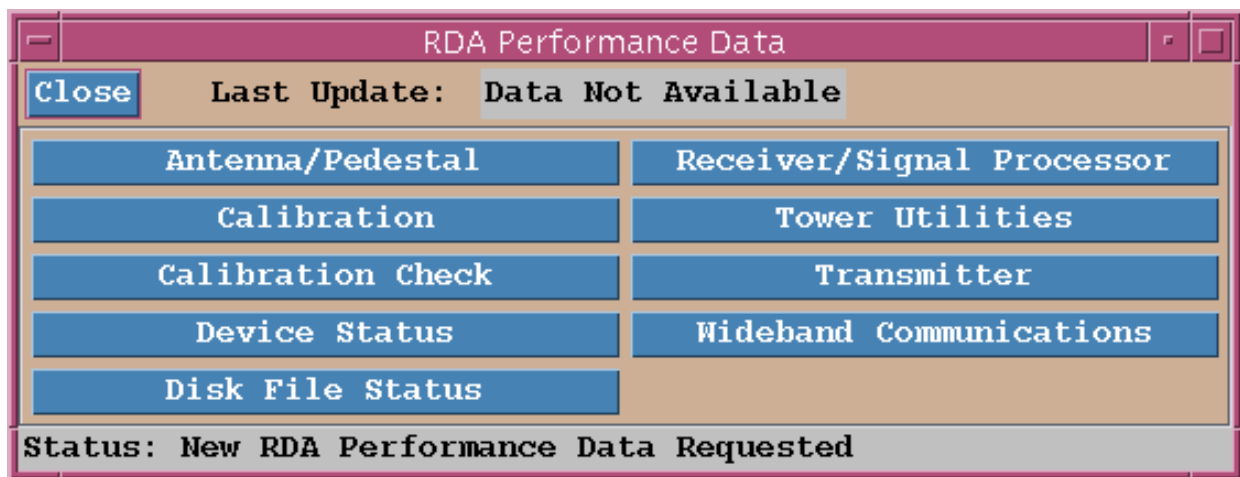


Figure 2-86. RDA Performance Data

Select from the following buttons to view the most recent performance data from the RDA. The bottom Status: line is a non-editable line of information that is automatically sent to the window that describes the availability of the RDA data.

- Antenna/Pedestal ([Figure 2-87](#))
- Calibration ([Figure 2-88](#))
- Calibration Check ([Figure 2-89](#))
- Device Status ([Figure 2-90](#))
- Disk File Status ([Figure 2-91](#))
- Receiver/Signal Processor ([Figure 2-92](#))
- Tower Utilities ([Figure 2-93](#))
- Transmitter ([Figure 2-94](#))
- Wideband Communications ([Figure 2-95](#))

Clicking on each button listed above will produce one of three different results. If no performance data is available, then the window will not even open and a warning_popup window opens that states: “RDA Performance Data unavailable.” Click on Continue and the user is returned to the RDA Performance Data window.

If old performance data is available, then the associated window is opened and it will display the most current data as indicated within the window in the Last Update field.

If new data is available, then the window is opened and then updated automatically at the same time (Figure 2-87 through 2-95). This process is observed by the user when the screen is refreshed. The old data is replaced by new data and the date and time changes in the Last Update field.

If any of these windows are left opened, they will not update automatically when new performance data is available from the RDA. To display any new data, the user must click on the Update button within the window. Shortly after clicking on the Update button, the screen will be refreshed, old data is replaced by new, and the Last Update field changed.

Several different RDA Performance Data windows can be open at the same time. However, it is important to be aware of the fact that opening any of these windows not only updates that window, but also updates any other windows that are already opened. Additionally, if more than one of these windows are open, clicking on the Update button in any of these windows will not only update that specific window, but it will also update all of the other windows that are already opened.

Clicking on the Close button within any of the RDA Performance Data windows will close that specific window. Clicking on the Close button within the main RDA Performance Data selection menu window not only closes that specific window, but also closes all of the specific RDA Performance Data windows that had been opened from it.

2.3.17.5.1 Antenna/Pedestal Performance Data.

RDA Antenna/Pedestal Performance Data - (FAA:2)			
Close	Update	Last Update:	Jul 21, 2004 - 16:46:55 UT
Ped +150V	OK	Servo	ON
El Amp	OK	Az Amp	OK
El Motor	OK	Az Motor	OK
El Stow Pin	OPER	Az Stow Pin	OPER
El PCU Parity	OK	Az PCU Parity	OK
El Dead Limit	OK	Az Bullgear Oil	OK
El + Limit	OK		
El - Limit	OK		
El Encoder Light	OK	Az Encoder Light	OK
El Gearbox Oil	OK	Az Gearbox Oil	OK
El Handwheel	OPER	Az Handwheel	OPER
El Amp PS	OK	Az Amp PS	OK
El Pos Corr	0.04 Deg	Az Pos Corr	359.69 Deg
		Ped +28V PS	27.84 V
		Ped +15V PS	14.98 V
		Ped + 5V PS	4.87 V
		Enc + 5V PS	6.48 V
		Ped -15V PS	-15.06 V
		Self Test 1 Status	OK
		Self Test 2 Status	OK
		Self Test 2 Data	0000
		Ped Intlk Switch	OPER

Figure 2-87. RDA Antenna/Pedestal Performance Data

2.3.17.5.2 Calibration Performance Data.

[illegible]

Figure 2-88. RDA Calibration Performance Data

2.3.17.5.3 Calibration Check Performance Data.

RDA Calibration Check Performance Data

Close **Update** **Last Update: Feb 1, 2001 - 14:57:23 UT**

Target Amplitude (dBz)						
LIN			LOG			
Expected	Measured	Delta	Expected	Measured	Delta	
KD1	12.02	10.50	-1.52	12.02	9.50	-2.52
KD2	-12.00	-13.00	-1.00	-12.00	-13.50	-1.50
KD3	-21.83	-23.00	-1.17	-21.83	-22.50	-0.67
Avg KD		-1.23			-1.56	

Clutter Suppression Channel Power (dB)			
	LIN	LOG	
Unfiltered	19.85	23.05	
Filtered	18.48	-27.29	
Suppression	1.36	50.33	

Figure 2-89. RDA Calibration Check Performance Data

2.3.17.5.4 Device Status Performance Data.

RDA Device Status Performance Data			
<input type="button" value="Close"/> <input type="button" value="Update"/>		Last Update: Feb 1, 2001 - 14:58:15 UT	
DEVICE INITIALIZATION		Device I/O Error Status	
DAU Init Status	OK	Summary	Time
Maint Console Init Status	OK		
Pedestal Init Status	OK		
SPS Init Status	OK	48018282	10/02/98 01:29:17
SPS Download Status	OK		
SPS DIM Loop Test Status	OK		
SPS SMI Loop Test Status	OK		
SPS HSP Loop Test Status	OK	0	
RP6 Link Init Status	OK		
User Link Init Status	NO		
DAU MC PED SPS DISK ARCH II REDUND			

Figure 2-90. RDA Device Status Performance Data

2.3.17.5.5 Disk File Status Performance Data.

RDA Disk File Status Performance Data		
Close	Update	Last Update: Feb 1, 2001 - 14:59:14 UT
Disk File Status		
State	Read	Write
Bypass Map	OK	OK
RDASC Cal Data	OK	OK
RDASOT Cal Data	OK	
Mod Adapt	OK	
Censor Zone	OK	OK
Remote VCP	OK	OK

Figure 2-91. RDA Disk File Status Performance Data

2.3.17.5.6 Receiver/Signal Processor Performance Data.

Close

Update

Last Update: Feb 1, 2001 - 15:00:10 UT

RF Gen Freq Sel Osc	OK	Parity Tst Gen RAM	OK	IDU Tst Detection	40
RF Gen RF/STALO	OK	System Noise Temp	324 K	+5V Receiver PS	OK
Phase Shifted COHO	OK	Prt Interval 1	7472	+18V Receiver PS	OK
COHO/Clock	OK	Prt Interval 2	21488	-9V Receiver PS	OK
Parity CF1	OK	Sig Proc +5V PS	5.00 V	+9V Receiver PS	OK
Parity CF2	OK	Short Pulse Lin Chan Noise	2.338E-06	+15V A/D Conv PS	OK
Parity CF3	OK	Short Pulse Log Chan Noise	2.005E-05	+5V A/D Conv PS	OK
Parity CF4	OK	Long Pulse Lin Chan Noise	1.169E-06	-5.2V A/D Conv PS	OK
Parity CF5	OK	Long Pulse Log Chan Noise	1.002E-05	+5V Rec Prot PS	OK
Parity CF6	OK				

RDA Receiver/Signal Processor Performance Data

Figure 2-92. RDA Receiver/Signal Processor Performance Data

2.3.17.5.7 Tower Utilities Performance Data.

RDA Tower Utilities Performance Data											
Close		Update		Last Update: Feb 1, 2001 - 15:01:04 UT							
AC #1 Compressor	OK			Pwr Xfer Switch	AUTO			Equipment Shelter	OK	DAU Test 0	9
AC #2 Compressor	OK			Pwr Source	UTILITY			Equip Shelter Fire Sys	OK	DAU Test 1	125
				Gen Battery Voltage	OK			Equip Shelter Temp	20.8 C	DAU Test 2	232
				Gen Engine	OK			Radome Hatch	CLOSED	UART	OK
AC #1 Air Temp	9.3 C			Gen Volt/Freq	NOT AVAIL			Radome Air Temp	16.2 C	MC +28V PS	28.01 V
AC #2 Air Temp	37.3 C			Util Volt/Freq	AVAILABLE			Outside Temp	7.8 C	MC +15V PS	14.98 V
				Gen Shelter	OK			Xntr Air Temp	27.4 C	MC +5V PS	4.97 V
				Gen Shelter Fire Sys	OK			Aircraft Lighting	OK	MC -15V PS	-15.00 V
AC #1 Filter	OK			Gen Shelter Temp	16.4 C			Site Security	ALARM	Chan in Control	NA
AC #2 Filter	OK			Gen Fuel Level	61.8 %			Security Equip	OK	Int Proc Response	NA
				Gen Maint Req'd	NO			Security Sys	DISABLED		
				Trans Pwr Source	Off						

Figure 2-93. RDA Tower Utilities Performance Data

2.3.17.5.8 Transmitter Performance Data.

RDA Transmitter Performance Data			
<input type="button" value="Close"/>	<input type="button" value="Update"/>	Last Update: Feb 1, 2001 - 15:02:08 UT	
Summary			
Xmtr Inop	OK	WG/PFN Xfer Intlk	OK
Xmtr Available	YES	Circulator Temp	OK
Maintenance Mode	NO	Filament ps	ON
Maintenance Required	NO	Filament ps Volt	OK
Antenna Peak Power	516 kW	+ 5V ps	OK
Xmtr Peak Power	734 kW	+ 15V ps	OK
Antenna Avg Power	903.6 W	- 15V ps	OK
Xmtr Avg Power	1269.6 W	+ 28V ps	OK
Microwave Loss	1.5 dB	+ 45V ps	OK
Antenna Power Meter Zero	6.0	Vacuum Pump ps	OK
Xmtr Power Meter Zero	2.9	WG Arc/vswr	OK
Xmtr Air Filter	OK	WG Press/Hmd	OK
		Spect Filt Press	OK
High Voltage			
Xmtr Recycle Count	0	Cabinet Intlk	OK
Klystron Warmup	NORM	Cabinet Air Temp	OK
WG Switch Position	ANT	Cabinet Airflow	OK
PFN Switch Position	SHORT	Mod Overload	OK
Klystron Current	OK	Mod Inv Current	OK
Klystron Filament Cur	OK	Mod Switch Fail	OK
Klystron Vacuon Cur	OK	Mod Switch Maint	OK
Klystron Air Temp	OK	Main Power Voltage	OK
Klystron Airflow	OK	Xmtr Overvoltage	OK
Focus Coil Airflow	OK	Xmtr Overcurrent	OK
Focus Coil PS	OK	Xmtr Battery Charging	YES
Focus Coil Cur	OK		
Test Results			
		Flyback Charger	OK
		Inv Diode Curr	OK
		Trigger Amp	OK
		PRF Limit	OK
		DAU Interface	OK
		Oil Temperature	OK
		Oil Level	OK
		Post Chg Reg	OK
		Test Bit 0	OK
		Test Bit 1	OK
		Test Bit 2	OK
		Test Bit 3	OK
		Test Bit 4	OK
		Test Bit 5	OK
		Test Bit 6	OK
		Test Bit 7	OK

Figure 2-94. RDA Transmitter Performance Data

2.3.17.5.9 Wideband Communications Performance Data.

RDA Wideband Communications Performance Data		
Close	Update	Last Update: Sep 26, 2003 - 13:28:23 UT
	Wideband Link	
	RPG	USER
DCU Status	0000	0000
General Error Code	1F	00
SVC 15 Error Code	00	00
Outgoing Frames	20402	0
Frames with FCS Errors	0	0
Retransmitted I-Frames	0	0
Polls Sent and Received	55	0
Poll Time-Outs	0	0
Min Buffers in Read-Pool	5	0
Max Buffers in Read-Done List	1	0
Loop-Back Test	PASS	NOT CNFG

Figure 2-95. RDA Wideband Communications Performance Data

2.3.17.6 Console Messages. Clicking on the Console Messages icon opens the Console Messages window. See [Figure 2-96](#). Clicking on the Close button will close the Console Messages window. There are three areas within this window that allow the user to select the Destinations, look at incoming messages, and prepare and send outgoing messages.

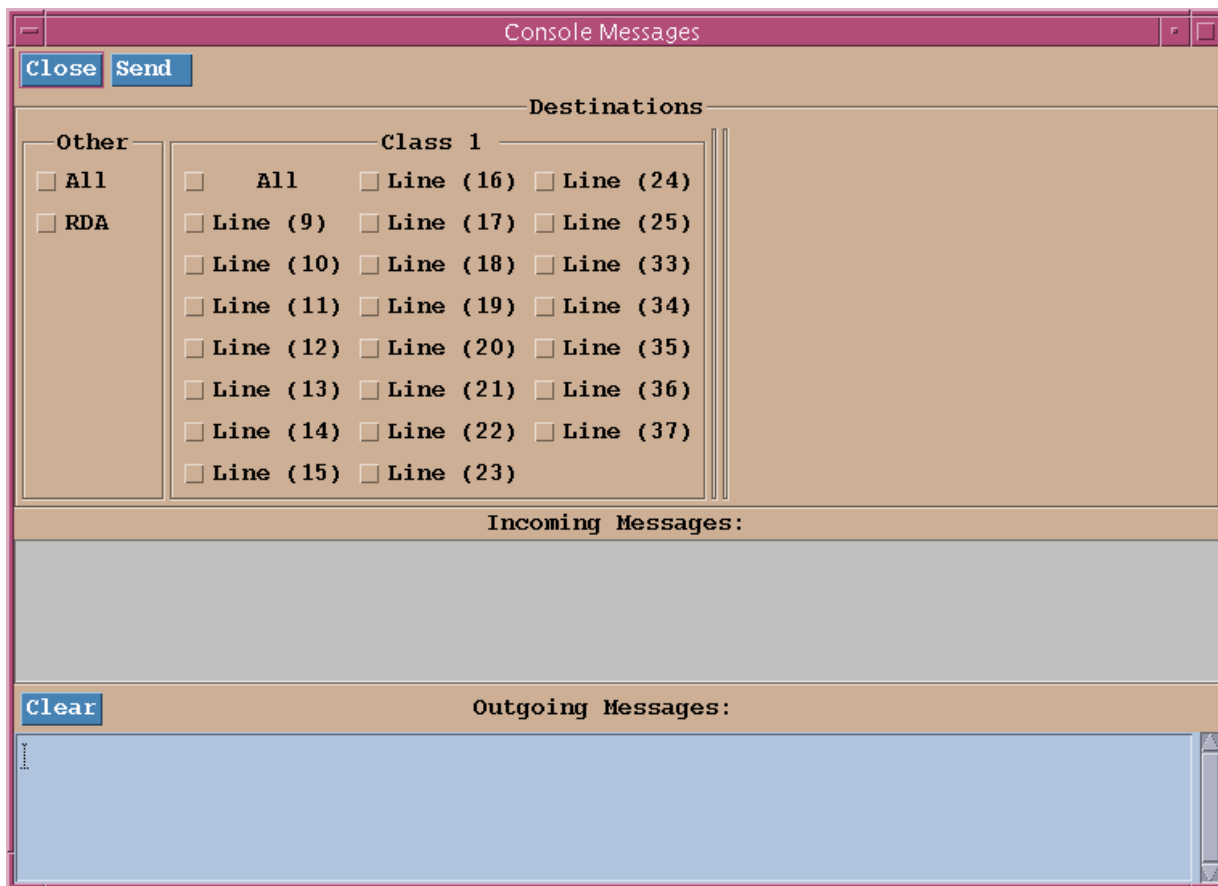


Figure 2-96. Console Messages

2.3.17.6.1 Destinations. The possible destinations for an outgoing message are:

- Other: All and RDA (and RMS for FAA sites). The selection of ALL does NOT include the Class 1 destinations but is only for the RDA (and the RMS)
- Class 1: All and each specific Class 1 user. This includes the RPGOP_50 and RPGOP_90 lines. The selection of All does NOT include the Other destinations (RDA and RMS) but is only for the Class 1 lines.

Select a destination(s) for the outgoing message by clicking on the box next to the desired destination(s) (or on the destination name itself) which places a check mark in the box. Only the destination selection(s) that have a check mark present in the box will be sent the outgoing message. The “All” selections are a toggle that will alternately select and deselect all of the destinations within that class.

2.3.17.6.2 Incoming Messages. All incoming messages are displayed in the “Incoming Messages:” area of the window. They are listed in order from newest to oldest, with the newest being at the top of the list. When a new incoming message is received from any source, this window will open automatically and the new message is displayed at the top of the list in the “Incoming Mes-

sages:” area. There is no indication given at the RPG to inform the user of the source of any incoming message unless it was written into the message itself by the sender. The possible sources of an incoming message are the RDA and the RPGOP.

2.3.17.6.3 Outgoing Messages. To send a message to any destination, the user must first click in the “Outgoing Messages:” area of the window to activate it. By clicking on the Clear button, the entire “Outgoing Messages:” area is completely cleared out of any text that may be left from the previous outgoing message. Next, the user types in the desired message. After typing the message, click on the desired destination and then click on the Send button. If the user clicks on the Send button without selecting a destination, a warning_popup opens that states: “A destination(s) must be selected before the message can be sent.” Click on the Continue button and the user is returned to the Console Messages window. A destination can then be selected, the Send button clicked, and the message will be sent.

There are limitations to the length of messages allowed. Messages to the RDA can only be 404 characters. Messages to the RMS (for FAA sites) can only be 400 characters. Messages to the users have a maximum size of 48 lines of 80 characters each. If any of these limits are exceeded and the Send button clicked, a warning_popup will appear that defines the limitation and describes how much of the message was truncated. For example, if sending a message that is too long to the RDA, the warning_popup will state: "The message to the RDA was truncated to 404 characters. XXX characters were discarded. Continue" XXX are the number of characters that were discarded. Click on the Continue button to return back to the Console Messages window, even though the truncated message has already been sent. If the user wants to edit the message and send it again, the entire text is still in the Outgoing Messages edit box.

Once a message is sent, the Feedback line at the bottom of the HCI will display the one line text of "Sending Console Message."

2.3.17.7 Environmental Data. Clicking on the Environmental Data icon opens the Environmental Data Editor window. It provides a window in which the user can modify the environmental conditions used by the algorithms. It is described in complete detail in Chapter 3.

2.3.17.8 HCI Properties. Clicking on the HCI Properties icon opens the HCI Properties window that allows the user to select Passwords, Colors or Font Properties. See [Figure 2-97](#). The Close button closes the HCI Properties window and returns the user to the HCI.



Figure 2-97. HCI Properties

2.3.17.8.1 Change Passwords. Clicking on the Passwords button opens the Change Passwords window. See [Figure 2-98](#).

Figure 2-98. Change Passwords

Click on the Close button to close the window and return the user to the HCI Properties window. In order to change the password, select the desired LOCA by clicking on the button to the left of the LOCA or on the LOCA itself. The button will change to white. Then move the cursor to the editing field labeled Old Password and click to get the cursor blinking in that field. The field will turn to blue. Enter in the old password correctly, press the return key, and the cursor will then move to the New Password: editing field. The three LOCAs and the Old Password field entry are grayed-out and desensitized. The Old Password field turns back to the background color and the New Password field turns blue with the blinking cursor in the left hand margin of the field.

However, if an incorrect password was entered, a warning_popup window opens that states:

“You entered an invalid password!”. Click on the Continue button and the user is returned to the Old Password: field. Reenter the correct old password in order to move to the New Password: field.

Once the field for the new password has turned blue, enter the new password (case sensitive) and press the Return key. The cursor then moves to the Verify New Password: field and turns the field to blue. Enter the new password again and press the Return key. If the entry is correct, a warning_popup window opens that states: “The password has been changed!”. Click on the Continue button and the user is sent back to the Change Passwords window. Then click on the Close button to return to the HCI Properties window.

However, if the New Password and Verify New Password fields don’t match, a warning_popup window opens that states: “You entered an invalid password!”. Click on the Continue button and the user is returned to the Change Passwords window to start all over again.

2.3.17.8.2 Colors. Click on the colors button and a warning_popup window opens that states: “This function is not available at this time!” Click on the Continue button and the user is returned to the HCI Properties window.

2.3.17.8.3 Font Properties. Click on the Font Properties button and the Font Properties window opens. See [Figure 2-99](#). There are three control buttons across the top and two categories of data entry: Size and Point. Clicking on the Close button closes the Font Properties window and returns the user to the HCI Properties window.

Click on the Default button to restore the Size and Point values to the original values. The change(s) will be seen immediately in the Font Properties window, but the numerical values will not change until the Apply button is clicked and the Font Properties window closed and then reopened. There is no warning_popup associated with the Default button.

The Apply button is grayed-out and desensitized until a change has been made in an edit field. Once that has occurred, the apply button is sensitized.

Click on the Apply button to have the values apply to all the pull up windows on the HCI. This applies to both the default values and the operator entered values.

To change the Size, click in the field box to the right of the title Size to get the cursor blinking in the edit field. The allowable range is 80 to 100. If an incorrect value XXX is entered, a warning_popup opens that states: “You entered an invalid font size of XXX. The value must be in the range 80 to 100.” Click on the Continue button and the user is returned to the Font Properties window. If a correct value is entered and the Return key pressed, the change is shown immediately on the Font Properties window and the new value is shown in the box.

To change the Point, click in the box to the right of the title Point to get the cursor blinking in the edit field. The allowable range is 80 to 100. If an incorrect value XXX is entered, a warning_popup opens that states: “You entered an invalid font point of XXX. The value must be in the range 80 to 100.” Click on the Continue button and the user is returned to the Font Properties window. If a correct value is entered and the Return key pressed, the change is shown immediately on the Font Properties window and the new value is shown in the box.

New font properties DO NOT apply to the HCI, all window title bars, or warning_popup windows.

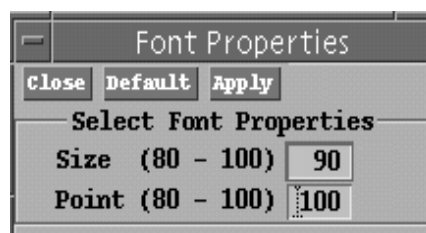


Figure 2-99. Font Properties

2.3.18 Multiple Editors.

It is possible to have multiple edit windows opened at the same time by the same operator or with a remote HCI to another site, opened by two different operators. However, when an edit window is opened which is currently being edited by another user (or the same user), a warning_popup opens that states: “Another user is currently editing XXXXX data. Any modifications you make may be overwritten by the other user. Do you want to proceed with the unlock?” Click Yes or No and that action will be taken. “XXXXX” will be one of the following HCI tasks:

- Clutter Suppression Regions Editor
- Clutter Bypass Map Editor
- Alert Threshold Table Editor
- Product Priority
- Selectable Product Parameters
- Algorithm Adaptation Data Editor
- Product Generation Table Editor (Last sentence of warning_popup is omitted for this editor as there is no password control on this window)

NOTE

When multiple edit windows are open, the one that is saved and closed first will have its edits lost when the second window is saved. There is no prioritization of edits being saved based on who opened the windows at which time, nor from which location the edits are being made.

2.3.19 Low Bandwidth.

If the site has a distant MSCF, an extra comment "<LB>" will be displayed in the title bar. An example of the title is: "PRF Selection (Modify Current VCP) <LB> (FAA:2). This identifies a Low bandwidth version of some HCI windows that were designed to run on Distant MSCFs because of their limited bandwidth design.

SECTION 2.4. LOGIN/LOGOUT PROCEDURES

2.4.1 General.

The RPG software is designed to be operational continuously. The system should not be manually shut off for any routine procedures by any operators. Detailed information on the UNIX operating system is available in the NWS EHB 6-525, Maintenance Manual. However, for the scope of this manual, only the routine Login/Logout procedures will be addressed.

2.4.2 Login.

For routine operations, the RPG will be fully operational with the screen saver leaving the screen blank. The user must either move the mouse or press any key to refresh the screen.

2.4.2.1 Display Locked Window. The first window that may appear will state:

Display locked by user (xxxx).
Enter password to unlock
Password: (text entry field)

Enter in the correct password (case sensitive) and press the Return key. This allows the user to then continue with the log in procedures that follow.

Depending upon the site's configuration, this Display Locked Window may not appear. Instead, the user will see the full screen warning - Warning US Government System window in the paragraph below as the first window.

2.4.2.2 User Name. The “Warning - Site Name - Warning - US Government System text message” window will appear with the Sun logo along the right hand side.

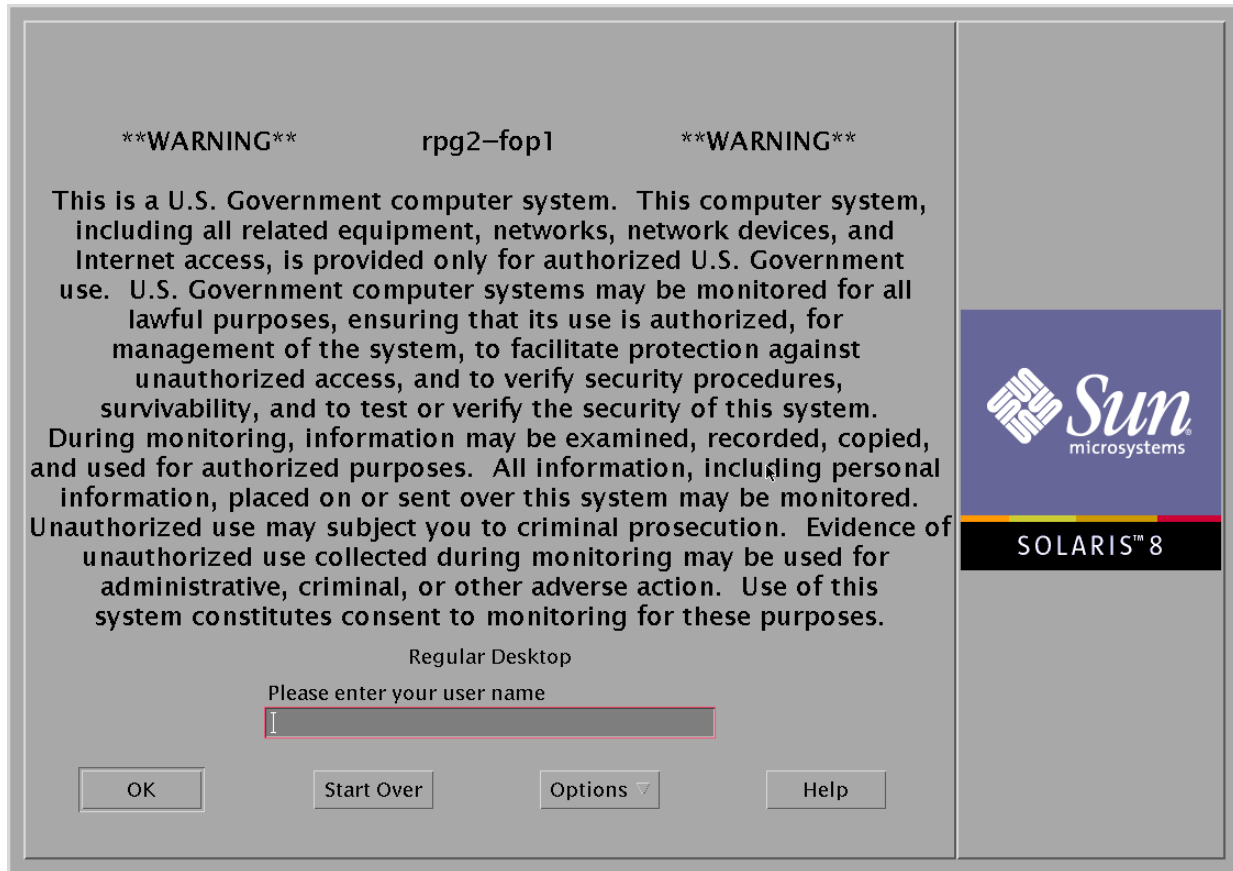


Figure 2-100. CDE Login Window

Just below the text of the warning will be the message: “Please enter your user name” with a dark gray text entry block with a blinking cursor. Enter in the user name (case sensitive) and press the Return key. There are four buttons below the text entry field that may be used if necessary. They are: OK, Start Over, Options (with a pull down menu) and Help.

2.4.2.3 Password. Once a valid user name has been entered and the Return key pressed, the next window to appear has the user name on the top, a message near the bottom that states: “Please enter your password” with a text entry field with a blinking cursor. Enter the password (case sensitive) and press the Return key. The screen does not echo or display the characters entered or any wild card characters for security purposes. The same four additional blocks are below the text entry block that may be used. They are: OK, Start Over, Options (with a pull down menu) and Help.

2.4.2.4 Common Desktop Environment (CDE). Once the user has successfully entered the password and logged in to the Solaris system, the system should automatically boot up a Console window, a Terminal window, the MSCF, a Clock, and the CDE front panel.

If the MSCF does not appear, go to the Console window and at the : prompt, type in "mscf&" and press the Return key. The MSCF window then opens up for access to the rest of the system.

If there is no Console window but a Solaris window that states:

Welcome to Solaris. The following desktops are available. Which one would you like to use as your default desktop? Note: You can change this default at any time by using the Session Menu located on the Desktop Logic Screens Options Menu. Choose One:

- Common Desktop Environment
- Fail Safe session
- Regular Desktop
- Open Windows Desktop
- User's Last Desktop

There are two other buttons below these choices: OK and Cancel.

Click on the Common Desktop Environment (CDE) option and then on the OK button.

If a previous login had been recently performed, this window may not open but automatically forward the user to the Sun window.

2.4.2.5 Sun Window. The user will end up with the Sun window, the CDE Front Panel at the bottom, a Console window, and a Terminal window.

2.4.2.6 Workspace Menu. Right click anywhere on the Sun window background and the Workspace Menu opens. The menu will list the following options:

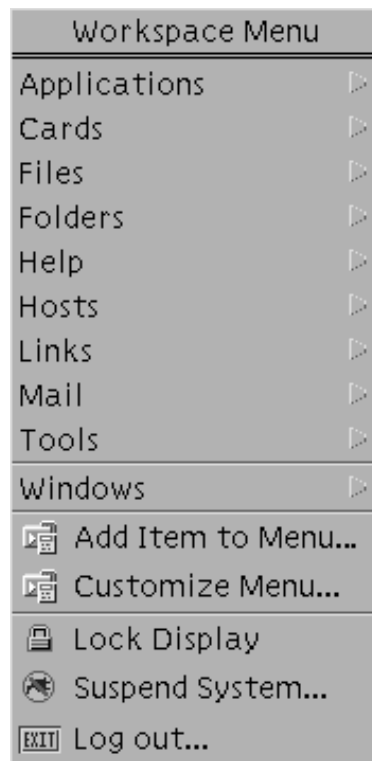


Figure 2-101. Workspace Menu

2.4.2.7 Console Window. Several lines of information will be at the top of the interactive screen inside the window. Then, within a minute, the Master System Control Functions window opens. If it doesn't, enter “mscf&” and press the Return key.

2.4.2.8 MSCF - Start. Once the MSCF window has appeared, click on the RPG HCI button to bring up the HCI. The user is then ready to use the fully operational HCI.

2.4.3 Logout.

When the user has completed their actions on the RPG, or are ending their shift and turning the radar over to another user, they need to log out of the HCI and MSCF. With the HCI fully operational, use the left mouse button and double click on the upper left hand corner of the HCI. This will return the user to the MSCF window.

At the MSCF window, click on the close button in the upper left hand corner and the user will be sent back to the Console window. Don't close the Console window, but instead click on the EXIT button in the CDE front panel. This opens the Logout Confirmation window. See [Figure 2-102](#).

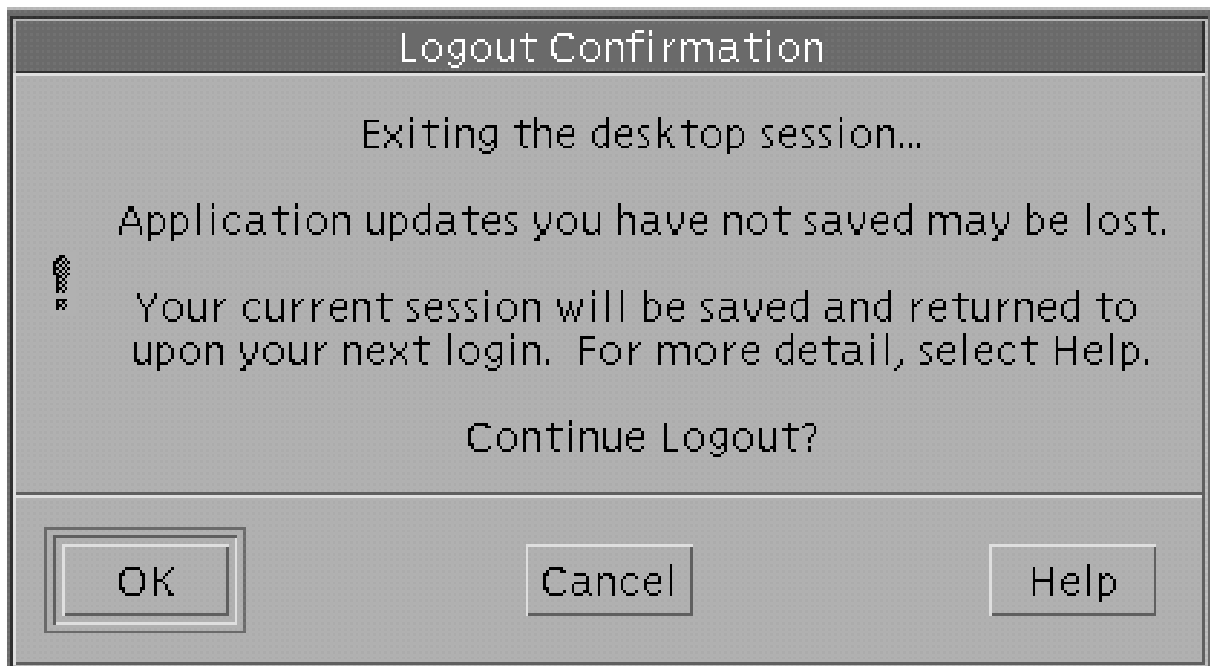


Figure 2-102. Logout Confirmation

Click on the OK button, the screen becomes blank, and the user is returned to the CDE Login window. The user is now logged out of the RPG.

SECTION 2.5. LOADING SOFTWARE, BACKING UP SOFTWARE, EMERGENCY RECOVERY PROCEDURES

2.5.1 General.

At most sites the System Administrator or Site Technician will handle all software loading, backing up the current software (especially as adaptable parameters are entered or modified), and any emergency recovery procedures. If a situation arises where those personnel are not available, then the procedures identified in the NWS EHB 6-525 Maintenance Instructions Radar Product Generator (RPG) can be used to assist a site in updating or restoring the RPG to an operational status.

2.5.2 System Time/Date.

Network Time Protocol (NTP) has been added in Software Build 1.2. For NWS, NTP will keep the MSCF, BDDS, and RPG within a second of the master AWIPS time. For FAA or DoD using frame relay service, NTP will keep the BDDS and RPG within a second of the AWIPS master time. For FAA or DoD without frame relay service, NTP will keep the BDDS and RPG within a second of the MSCF master time. The date/time shall be manually set on the initial installation of the system. The System Administrator needs to make sure that all the systems start within 1000 seconds of the master clock. The automated NTP process will not attempt to synchronize clocks outside of plus or minus 1000 seconds. When a system is outside of the 1000 second rule the console will display messages like **"Dec 30 2:44:52 xntpd: time error -10306.13 is was too large (set clock manually)"**. When this occurs, the System Administrator or Site Technician must manually set the system time/date described in the NWS EHB 6-525, Table 4-76.

2.5.3 Loading Software.

When a new RPG software build is sent to a site, the System Administrator or site technician should load the software and ensure it is fully operational. There could be occasions where site personnel would need to perform a new software load such as a hardware replacement or an emergency security software patch. In such situations, the software loading procedures are available in a formal modification document as well as Chapter 4, NWS EHB 6-525.

When future software builds are released to the site, the System Administrator or site technician should perform the loading procedures. Specific load procedures will be included with each software build.

2.5.4 Backing Up Software.

There are five different options available to backup the software data. These five are listed in detail with specific procedures in the NWS EHB 6-525 and are referenced here. Obtain the NWS EHB 6-525 Manual and utilize the appropriate tables from that manual.

The System Administrator will normally have the backup disks secured in a specific location. When changes are made to the site's adaptation data, new backups will need to be made. These

backups should be performed and clearly documented so there is no confusion about the most recent backup disk.

2.5.4.1 System Software Backup Using ufsdump. Use of the ufsdump (User File System Dump) utility allows software to be backed up individually for each file system. This allows software to be restored individually for each file system. Thus, it allows for restoration of one file system without having to restore all file systems at the same time. For further information, see the System Software Backup Using ufsdump table in Chapter 4, NWS EHB 6-525.

2.5.4.2 RPG Applications Software Backup. The RPG Applications Software should be backed up after it is loaded and all adaptable parameters are set as desired. It should also be backed up after any changes are made to adaptable parameters. For further information, see the RPG Applications Software Backup table in Chapter 4, NWS EHB 6-525.

2.5.4.3 MSCF Applications Software Backup. Use the MSCF Applications Software Backup table in Chapter 4, NWS EHB 6-525 to make a backup of the MSCF Applications software table.

2.5.4.4 Backup of BDDS User Accounts Using tar. Use the Backup of BDDS User Accounts Using tar table in Chapter 4, NWS EHB 6-525 to make a backup of the BDDS user accounts.

2.5.4.5 Backup of RPG or MSCF User Accounts Using tar. Use Backup of RPG or MSCF User Accounts Using tar table in Chapter 4, NWS EHB 6-525 to make a backup of the RPG or MSCF user accounts.

2.5.5 Emergency Recovery Procedures.

There are five different options available to restore the software to the RPG. These are listed in detail with specific procedures in the NWS EHB 6-525 and are referenced here. Obtain the NWS EHB 6-525 Manual and utilize the appropriate tables from that manual.

2.5.5.1 System Software Restoral Using ufsrestore (Individual File System Example). The System Software Restoral Using ufsrestore table in Chapter 4, NWS EHB 6-525 provides the procedures for a partial restoration of the system software backup made using ufsrestore. In this procedure, individual file systems can be restored. This table is an example of an individual file system restoration.

2.5.5.2 RPG Applications Software Restoral. The RPG Applications Software Restoral table in Chapter 4, NWS EHB 6-525 provides the procedures for restoring the RPG applications software backup made using the procedures in NWS EHB 6-525 RPG Applications Software Backup table.

2.5.5.3 MSCF Applications Software Restoral. The MSCF Applications Software Restoral table in Chapter 4, NWS EHB 6-525 provides the procedures for restoring the MSCF applications software backup made using the procedures in the MSCF Applications Software Backup table, NWS EHB 6-525.

2.5.5.4 Restoral of RPG or MSCF User Accounts Made Using tar. The Restoral of RPG or MSCF User Accounts Made Using tar table in Chapter 4, NWS EHB 6-525 provides the procedures for restoring the RPG or MSCF user accounts from the backup made using the procedures in the Backup of RPG or MSCF User Accounts Using tar table, NWS EHB 6-525.

2.5.5.5 Restoral of BDDS User Accounts Made Using tar. The Restoral of BDDS User Accounts Made Using tar table in Chapter 4, NWS EHB 6-525 provides the procedures for restoring the BDDS user accounts made using the procedures in the Backup of BDDS User Accounts Using tar table, NWS EHB 6-525.

SECTION 2.6. BASE DATA

2.6.1 Base Data Distribution.

Base data is distributed via two different methods: Archive II LDM (Local Data Manager) and BDDS.

The Archive II LDM can be stopped and started through use of the Archive II LDM Data button directly under the RPG icon on the RPG Control/Status screen. A single left click on the Archive II LDM Data button brings up an Archive II LDM Data window. See [Figure 2-103](#).



Figure 2-103. Archive II LDM Data

This window has three control buttons: one for closing the window and two found in the Archive Level II LDM Control box area. The upper left button is the Close button. Clicking on the Close button will return the user to the RPG Status/Control screen. At the right of the screen is a text string labeled "Status:" with the following texts available: Active with a green background, Not Active with a yellow background, Attempting to Start with a yellow background, Attempting to Stop with a yellow background, and Unknown with a red background.

2.6.1.1 Start. Click on this button to start the Archive II LDM data flow. If Archive II LDM data is not active, the Stop Archive II button is grayed-out and desensitized. A warning_popup opens that states: "You are about to start Archive II. Do you want to continue?". Click on Yes or No.

2.6.1.2 Stop. Click on this button to stop the Archive II LDM data flow. If Archive II LDM data is active, the Start Archive II button is grayed-out and desensitized. A warning_popup opens that states: "You are about to stop Archive II. Do you want to continue?". Click on Yes or No.

2.6.1.3 BDDS HCI. The BDDS HCI button is located on the MSCF. The Archive Level II LDM Control commands discussed above are also contained in the BDDS HCI. The BDDS HCI button is discussed in more detail in Paragraph [2.2.7.6](#).

SECTION 2.7. REDUNDANT CONTROL

2.7.1 Introduction.

There are two types of redundant configurations in the WSR-88D series of radars. One is the NWS Redundant configuration with one RPG, two RDAs, and a switch which sends either RDA's information to the single RPG. Each RDA is called a channel. The other is the FAA Redundant configuration which contains two RPGs, each connected to a corresponding RDA. Each RDA/RPG pair is called a channel. Instructions on how to switch between channels for either system are described below.

2.7.2 NWS Redundant System Control.

There are several windows that provide information on which RDA is active.

The HCI has a comment in the title bar stating RDA:1 or RDA:2 is active.

The RDA Alarm Summary has RDA:1 or RDA:2 in the description field used as a title to indicate which RDA has the alarm.

There are no controls at the RPG that allow the user to switch from one RDA to the other RDA.

The above information is not displayed on non-redundant configurations.

2.7.3 FAA Redundant System Control.

There are portions of several windows that provide status on which channel is active and which is inactive, plus how to change from one channel to another. These portions of the windows are not displayed in non-redundant configurations.

2.7.3.1 MSCF Indication. There is an area to the far right titled: Channels. Directly underneath the title are two buttons. The left button has a "1" beside it; the right button has a "2" beside it. These numbers represent Channel 1 or Channel 2 in the FAA redundant configuration. See [Figure 2-104](#). The button that is highlighted white means that particular channel's data is being displayed in that MSCF window.

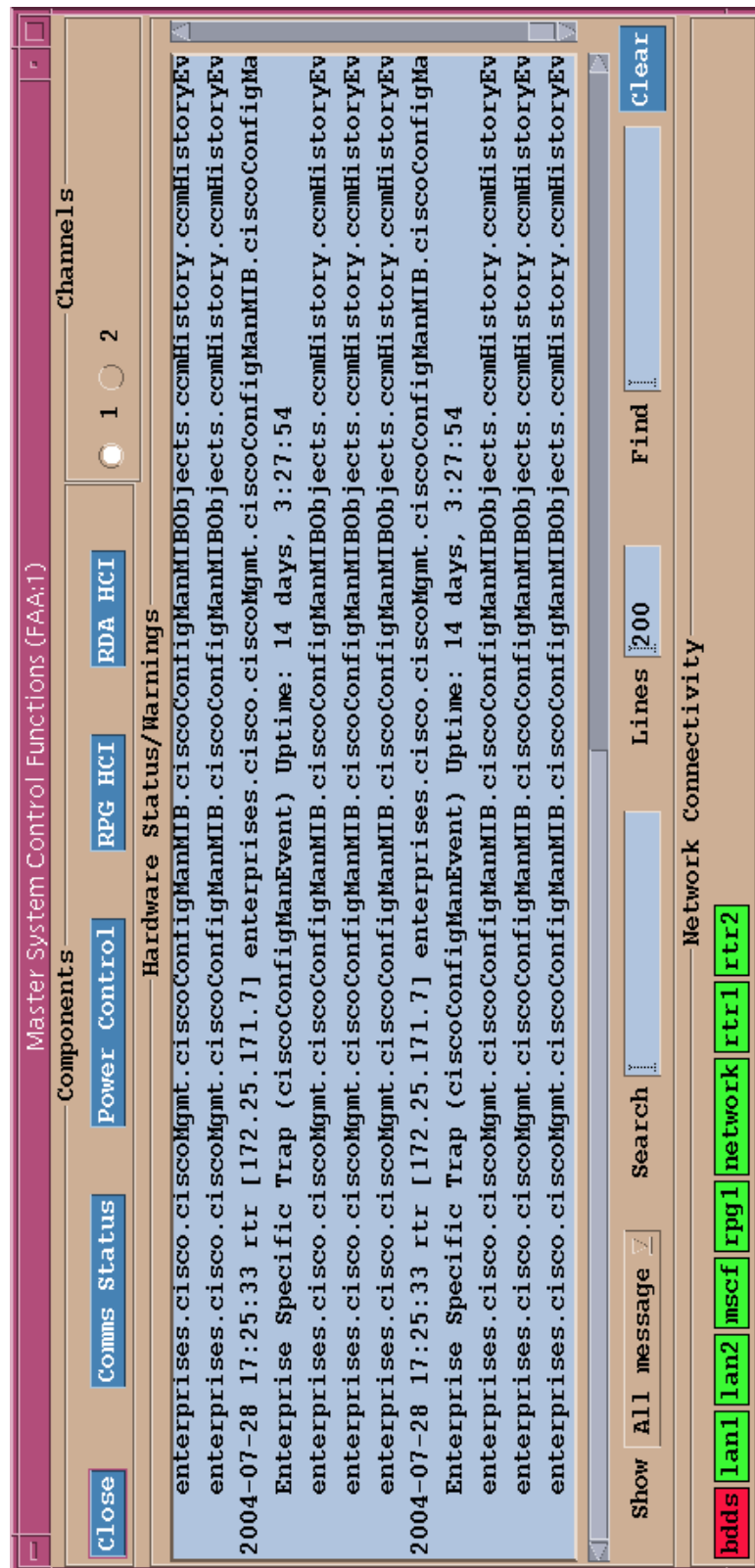


Figure 2-104. MSCF - FAA

To perform all functions for a particular channel such as selecting the RPG HCI, checking the power, or reading the Hardware Status/Warnings, the button directly to the left of that channel's number must be highlighted white. Click on the button to the left of the “1” and Channel 1 becomes the displayable channel when the button turns white. To display and interact with Channel 2, click on the button to the left of the “2”. When it becomes white, then Channel 2 becomes the displayable channel. These two buttons act as toggle switches. Only one can be highlighted white at a time.

2.7.3.2 FAA HCI Indications and Controls. The title bar of the FAA HCI identifies the channels as FAA:1 and FAA:2. The active channel will have the phrase “Active/Controlling” after the channel number. The inactive channel will have the phrase “Inactive/Non-Controlling” after the channel number. See [Figure 2-105](#).

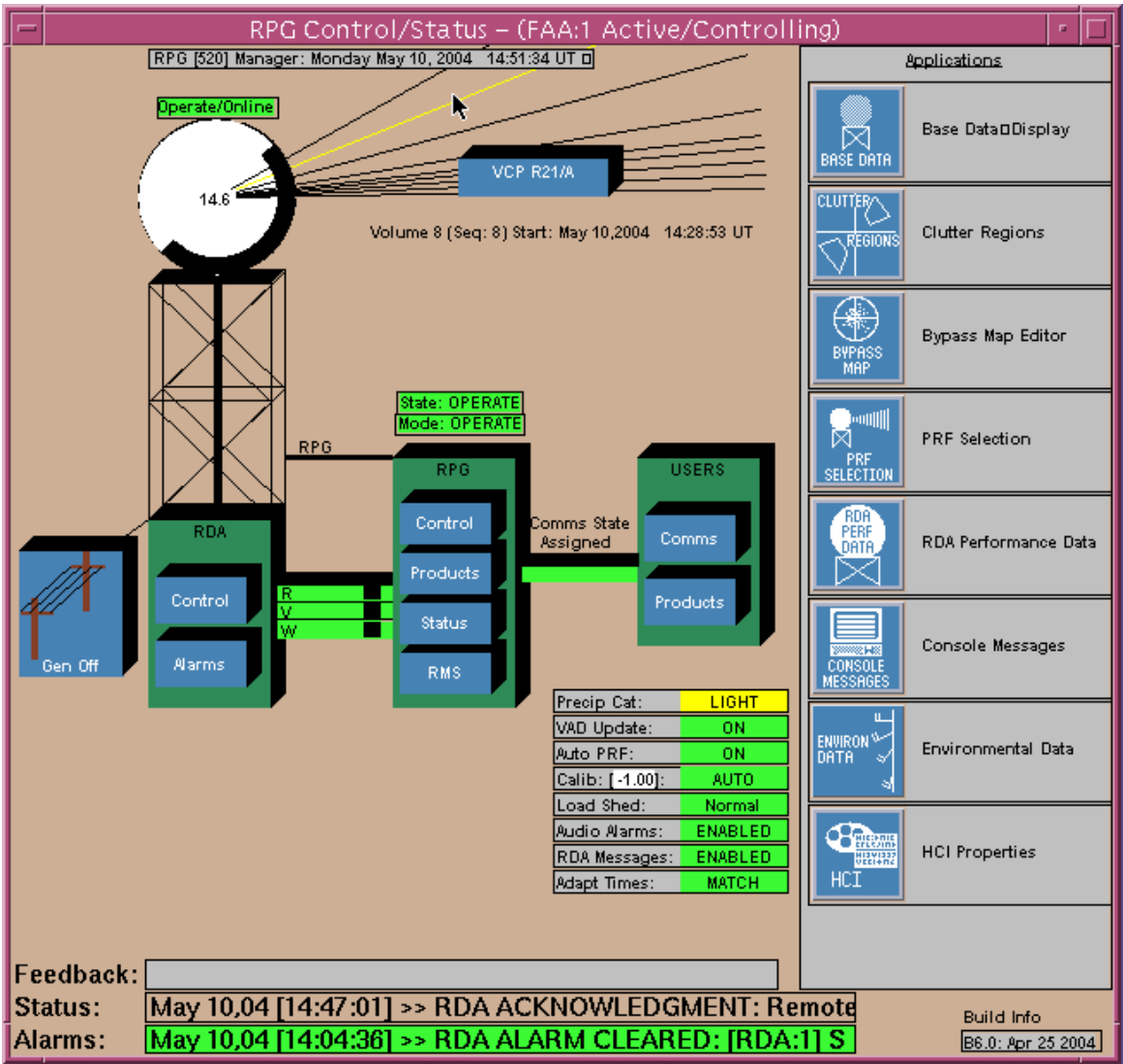


Figure 2-105. RPG Control/Status - FAA Sites

2.7.3.2.1 RMS Button. This button is visible only on the FAA redundant systems with RMS installed. It is located inside the RPG icon in the HCI as the fourth button (under the Control, Products, and Status buttons). If the RMS button has a blue background, then the RMS interface is functioning. If the RMS button has a red background, then the RMS interface is inoperative.

2.7.3.2.1.1 RMS Messages (FAA: 1 or 2) Window. Click on the RMS button and the RMS Messages (FAA: 1 or 2) window opens. See [Figure 2-106](#).



Figure 2-106. RMS Messages (FAA:1 or 2)

The RMS Messages (FAA:1 or 2) window has a Close button in the upper left hand corner. Clicking on the Close button returns the user to the HCI. Under the title RPG to RMS Messages, there are two button: RMS Inhibit and RMS Free Text. Click on either one of those buttons and a separate window opens when the RMS interface is functioning. If the RMS interface is not functioning, clicking on the RMS Inhibit button will bring up a warning_popup that states: “RMS Interface is Down. Click on OK to Continue.” Click on OK and the user is returned to the HCI. Clicking on the RMS Free Text button while the RMS interface is not functioning will not create any response at all. The user remains in the RMS Messages window.

2.7.3.2.1.1.1 RMS Inhibit Time Window. Clicking on the RMS Inhibit button brings up the RMS Inhibit Time window. See [Figure 2-107](#).

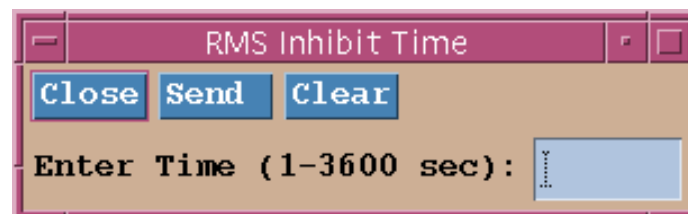


Figure 2-107. RMS Inhibit Time

The top line contains three control buttons. The Close button closes the window and returns the user to the RMS Messages window. The Send button sends the time period entered in the second row of this same window to the RMS to be used as the time period that no commands will be

accepted from the RMS to the RPG. This time period is effective as of the send time. The Clear button clears the data entry field in the second line.

The second line of this window contains the title Enter Time (1-3600 sec): and a data entry field. Click on the data entry field, move the blinking cursor to the left hand side of the field, and the user can then enter in a time period from 1 second to 3,600 seconds. This will be the desired time period that the RMS can not send any commands to the RPG. If an invalid entry is made and the Send button is clicked a warning_popup opens that states: "Value must be between 1 and 3600. Do you want to change the value?" Click on Yes or No. Clicking on Yes will return the user to the RMS Inhibit Time window. Clicking on No will return the user to the RMS Messages window. Once the desired value is entered, click on the Send button to send the time period to the RMS.

2.7.3.2.1.1.2 **RMS Free Text Message Window.** Clicking on the RMS Free Text button brings up the RMS Free Text Message window. See [Figure 2-108](#).



Figure 2-108. RMS Free Text Message

The top line contains three control buttons. The Close button closes the window and returns the user to the RMS Messages window. The Send button sends the free text message entered in the bottom data entry block of this same window to the RPG. The Clear button clears the data entry box of any previous input.

The second line of this window contains the title Free Text Message: and a data entry box. Click on the data entry box, have the blinking cursor in the upper left hand corner of the box, and the user can then enter in any type of free text message that is desired to be sent to the RMS. A maximum of 400 characters can be entered in the data entry box. If more than 400 are entered and the Send button clicked, a warning_popup appears that states: "RMS messages cannot exceed 400 characters. Message is XXX characters long. Do you want to change it?" XXX is the number of characters entered. Click on Yes to return to the data entry box to make the appropriate changes. Click on No and the user is returned to the RMS Messages window with the message being deleted from the RMS Free Text Message edit block without being sent. Once the text has been completely entered, click on the Send button and the text message is sent to the RMS.

2.7.3.2.2 RMS Lock Button. There is the capability to lock out the FAA RMS from transmitting any commands to either the RDA or the RPG.

2.7.3.2.2.1 RDA Lock RMS Button. Click on RDA Control button and the RDA Control/Status window opens. See [Figure 2-109](#).

RDA Control/Status - (FAA:1)

Close
Get Status
RDA Alarms
Moments
VCP
Lock RMS

RDA State

State: Operate

☐ Standby
 ☐ Offline Operate
 ☐ Playback
 ☐ Restart
 ☐ Operate

RDA Control

Control: Remote (RPS)

☐ Enable Local (RDA)
 ☐ Control Remote (RPS)

Interference Suppr.

Status: Enabled

☐ Enabled
 ☐ Disabled

RDA Power Source

Source: Utility

☐ Battery
 ☐ Auxiliary

Calibration

Status: Automatic

☐ Automatic
 ☐ Manual

Local Channel

Status: Controlling

Adapt: 02/03/01 13:33:46 UT

Redundant Channel

Status: Non-controlling

Adapt: 02/03/01 13:33:46 UT

Operational Mode

Operational

Calib. Correction

-3.25 db

Control Authority

No Action

Interference Rate

86/sec

Transmitter Power

392 watts

Moments Enabled

KVW

Figure 2-109. RDA Control/Status - FAA

On the right side of the top line of control buttons is a Lock RMS button. It is a on/off toggle switch. When clicked on (black check mark on white background), the RMS cannot send any commands to the RDA. When clicked off (no check mark and the background color in the button), the RMS can send commands to the RDA.

When changing the status of the Lock RMS button, a warning_popup will appear that states: “You are about to enable/disable the RMS to RDA commands. Do you want to continue?” Click on either Yes or No. The appropriate action will be taken and the user is returned to the RDA Control/Status window.

2.7.3.2.2.2 RPG Lock RMS Button. Click on RPG Control button and the RPG Control window opens. See [Figure 2-110](#).

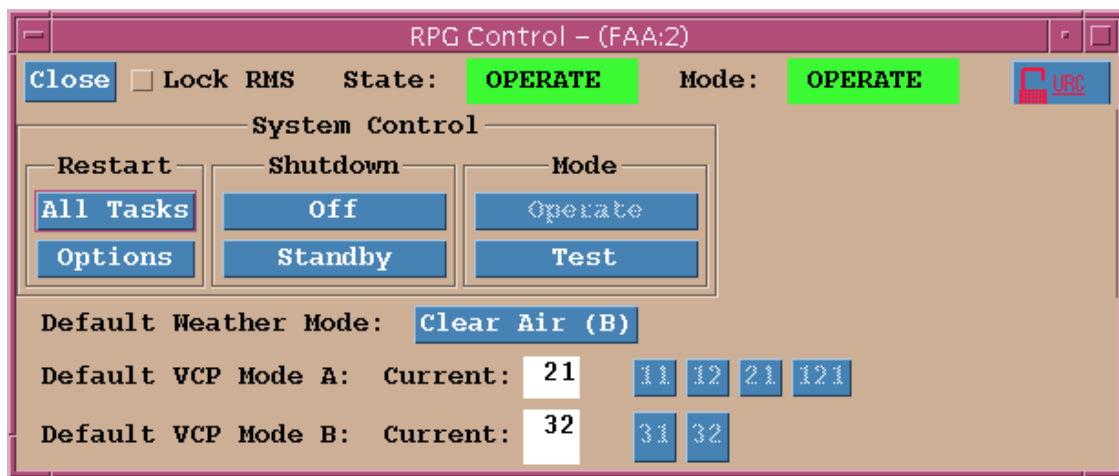


Figure 2-110. RPG Control (FAA)

On the left side of the top line of control buttons is a Lock RMS button. It is a on/off toggle switch. When clicked on (black check mark on white background), the RMS cannot send any commands to the RPG. When clicked off (no check mark and the background color in the button), the RMS can send commands to the RPG.

When changing the status of the Lock RMS button, a warning_popup will appear that states: “You are about to enable/disable the RMS to RPG commands. Do you want to continue?” Click on either Yes or No. The appropriate action will be taken and the user is returned to the RPG Control window.

2.7.3.2.3 Comms State. On the HCI ([Figure 2-105](#)), directly above the connecting bar from the RPG Box to the Users Box is a text line that reads: Comms State Assigned (or Unassigned). When looking at the HCI for the active channel, the status will be Assigned. When looking at the HCI for the inactive channel, the status will be Unassigned. The term Assigned means that all product distribution dial and dedicated modem circuits are connected to that channel.

2.7.3.2.4 Adapt Times Match/Mismatch. In the lower right hand corner of the FAA HCI is an eighth text line that states Adapt Times: MATCH (with a green background) or MISMATCH (with a red background). See [Figure 2-111](#) and [Figure 2-112](#).

Precip Cat:	NONE
VAD Update:	ON
Auto PRF:	ON
Calib: [0.00]:	AUTO
Load Shed:	Normal
Audio Alarms:	ENABLED
RDA Messages:	ENABLED
Adapt Times:	MATCH

Figure 2-111. Adapt Times: Match

Precip Cat:	NONE
VAD Update:	ON
Auto PRF:	ON
Calib: [0.00]:	AUTO
Load Shed:	Normal
Audio Alarms:	ENABLED
RDA Messages:	ENABLED
Adapt Times:	MISMATCH

Figure 2-112. Adapt Times: Mismatch

When any adaptation data is changed and saved on the active/controlling channel, the "Mismatch" title with the red background will briefly appear until the changes are automatically transferred over to the inactive/non-controlling channel. At that time, the "Match" title will reappear with the green background. No action is required by the operator to transfer the adaptation data and make the channels match each other.

Another area that will show the Match/Mismatch of the adaptation data is in the Redundant Control Section of the RDA Control window. The Adapt lines for both the Controlling and Non-controlling will have either the same date/time for Matching data with the grey background, or the different dates/times of Mismatching data with a red background. See [Figure 2-113](#).

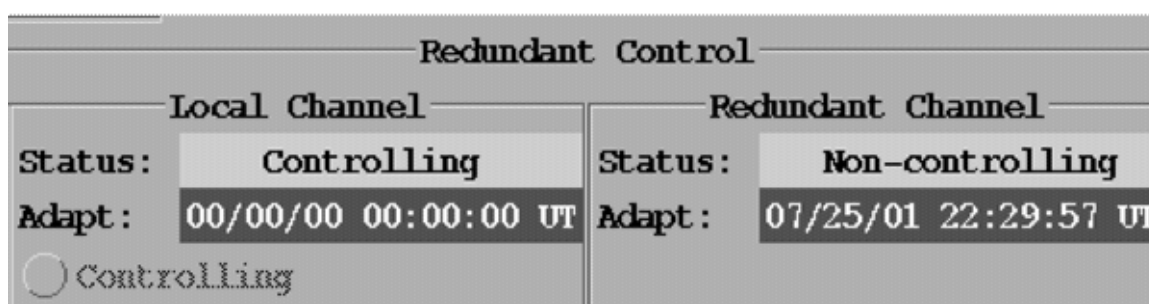


Figure 2-113. Adapt Times: Mismatch in RDA Control Window

2.7.3.3 Changing Control Channels. Click on the RDA Control button and the RDA Control / Status window opens. An additional text line to the right of the title reads either (FAA:1) or (FAA:2). See [Figure 2-114](#).

To the far right of the RDA Control/Status window is a section labeled Redundant Channel with two subsections under the title. The left subsection is called the Local Channel and the right subsection is called the Redundant Channel. Under both of these headings are two categories of information: Status: and Adapt:

These subsections vary depending on whether FAA:1 HCI is the selected HCI or FAA:2 HCI is the selected HCI, so they are described independently along with the available options for changing channels in each.

2.7.3.3.1 FAA:1 HCI, Switching From Channel 2 To Channel 1. When the HCI for FAA:1 is selected and viewed, Channel 1 is represented in the left subsection and is called the Local Channel. Channel 2 is called the Redundant Channel and is in the right subsection. See [Figure 2-114](#).

Close

Get Status

RDA Alarms

Moments

VCP

Lock RMS

RDA Control/Status - (FAA:1)

State: Operate

Standby

Restart

Offline Operate

Playback

RDA State

Control: Remote (RPG)

Enable Local (RDA)

Get Local Remote (RPG)

RDA Power Source

Source: Utility

Utility

Auxiliary

Interference Suppr.

Status: Enabled

Enabled

Disabled

Calibration

Status: Automatic

Automatic

Manual

Operational Mode:

Control Authority:

Transmitter Power:

Operational

No Action

392 Watts

Calib. Correction:

Interference Rate:

Moments Enabled:

-3.25 dB

86/sec

RW

Local Channel

Status: Controlling

Adapt: 02/03/01 13:33:46 UT

Redundant Channel

Status: Non-controlling

Adapt: 02/03/01 13:33:46 UT

Figure 2-114. RDA Control/Status - (FAA:1)

2-214

The controls to change the channels are password protected. To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7](#).

Underneath the Local Channel is only one button that is labeled Controlling. If the button and label are grayed-out and desensitized, then Channel 1 is the active/controlling channel. If the button and label are sensitized, then Channel 1 is inactive/non-controlling. The user can then click on this button and a warning_popup opens that states: “You are about to change the control state of this channel. Do you want to continue?” Click on either Yes or No. If Yes, Channel 1 will become the active/controlling channel and the button and label become grayed-out and desensitized. If No, then no changes take place and the user is returned to the HCI.

From this HCI (FAA:1), the user can only switch from Channel 2 to Channel 1.

Once the channels have been switched, the HCIs are no longer on the screen. The user has to go to the MSCF and reopen both HCIs. Also, the RDAs have been put into Standby. The user must click on the active channel RDA Control button, RDA State section, and click the Operate button in order to place the RDA in operation.

2.7.3.3.2 FAA:2 HCI, Switching from Channel 1 to Channel 2 and Back Again. When the HCI for FAA:2 is selected and viewed, Channel 2 is represented in the left subsection and is called the Local Channel. Channel 1 is called the Redundant Channel and is in the right subsection. See [Figure 2-115](#).

RDA Control/Status - (FAA:2)			
Close	Get Status	RDA Alarms	Moments <input type="checkbox"/> Lock RMS
RDA State State: Operate <input type="radio"/> Standby <input type="radio"/> Offline Operate <input type="radio"/> Restart <input type="radio"/> Playback <input type="radio"/> Operate		RDA Control Control: Remote (RPG) <input type="radio"/> Enable Local (RDA) <input type="radio"/> Select Remote (RPG)	
RDA Power Source Source: Utility <input type="radio"/> Utility <input type="radio"/> Auxiliary		Interference Suppr. Status: Enabled <input type="radio"/> Enabled <input type="radio"/> Disabled	
Calibration Status: Automatic <input type="radio"/> Automatic <input type="radio"/> Manual		Redundant Control <div> Local Channel Status: Controlling Adapt: 11/08/00 22:09:50 UT <input type="radio"/> Controlling <input type="radio"/> Non-controlling </div> <div> Redundant Channel Status: Non-controlling Adapt: 11/08/00 22:36:15 UT </div>	
Operational Mode: Operational Control Authority: No Action Transmitter Power: 347 Watts		Calib. Correction: -0.75 dB Interference Rate: 454/sec Moments Enabled: RW	

Figure 2-115. RDA Control/Status - (FAA: 2)

The controls to change the channels are password protected. To open the password protected fields for edit, follow the procedures described in paragraph 2.2.4.1.7.

Underneath the Local Channel are two buttons that are labeled Controlling and Non-controlling. If the Controlling button and label are sensitized and the Non-controlling button and label are grayed-out and desensitized, then Channel 2 is inactive/non-controlling. If the Controlling button and label are grayed-out and desensitized and the Non-controlling button and label are sensitized, then Channel 2 is active/controlling. The user can click on the sensitized button and a warning_popup opens that states: "You are about to change the control state of this channel. Do you want to continue?" Click on either Yes or No. If Yes, Channel 2 will change to the new control state and that button and label become grayed-out and desensitized. If No, then no changes take place and the user is returned to the HCI.

Underneath the Redundant Channel is one button that is labeled Controlling. If the button and label are sensitized, then Channel 1 is inactive/non-controlling. The user can click on this button and a warning_popup opens that states: "You are about to change the control state of this channel. Do you want to continue?" Click on either Yes or No. If Yes, Channel 1 will become the active/controlling channel and the button and label become grayed-out and desensitized. If No, then no changes take place and the user is returned to the HCI.

From this HCI (FAA:2), the user can switch back and forth between Channel 2 and Channel 1.

Once the channels have been switched, the HCIs are no longer on the screen. The user has to go to the MSCF and reopen both HCIs. Also, the RDAs have been put into Standby. The user must click on the active channel RDA Control button, RDA State section, and click the Operate button in order to place the RDA in operation.

2.7.3.4 Changing Adaptable Parameters on FAA Channels. The operator can change adaptable parameters on the active controlling channel at any time through the various windows on the HCI. However, if the operator attempts to change adaptable parameters on the non-active, non-controlling channel, a warning_popup will appear that states: "You cannot edit this data because the other RPG channel is Active." Click on the Continue button and the user is returned to the open window.

2.7.4 FAA Channels and LOCA Passwords.

When LOCA passwords are changed on one channel through the HCI Properties Password window, those passwords are changed for both channels. This precludes the operator from having one set of passwords on one channel and a second set of passwords on the other channel.

2.7.5 State of the System.

For FAA redundant configurations, it is recommended to place the RDA and RPG in standby before any channel changes take place. The user must then remember to place the RDA and RPG back into operate once the new channel has become the active channel. If the RDA and RPG are left in operate mode, they do switch to standby during the changeover, but then automatically

return to operate once the new channel becomes fully operational. Only one channel can be in on-line operate at a time, so be careful with which RDA/RPG is restored to operate.

For NWS redundant configurations, it is recommended to place the RDA in standby before any channel changes take place. The user must then remember to place the RDA back into operate once the new channel has become the active channel. If the RDA is left in operate mode, it does switch to standby during the changeover, but then automatically returns to operate once the new channel becomes fully operational. Only one channel can be in on-line operate at a time, so be careful with which RDA is restored to operate.

SECTION 2.8. HELP

2.8.1 General.

This section describes the Help system that is available with the HCI. It discusses the concept and then provides an example of how to actually use the system.

2.8.2 The Electronic Performance Support System Concept.

The Electronic Performance Support System (EPSS) provides the user with just-in-time, interactive, step-by-step instructions on performing a selected task. The EPSS provides both task/functional domain information and step-by-step instructions. In addition, it provides an “either or” facility for accessing information more specific to a particular area or task. For example, the user can select either information on a theory of operation or how to perform a step or steps to accomplish a task.

Additionally, the EPSS allows the user to decide how much or how little information is needed at the time the task is being performed relative to their experience/skill level and frequency of task performance. The user can navigate sequentially through each step within a selected task, “jump” to particular steps with which they are less familiar, and /or access further information regarding a specific step through the use of hypertext links.

The HCI EPSS provides the user with task and problem-based help selections along with concise functional domain information. The EPSS runs as a stand-alone module at the MSCF with no direct links to the MSCF software.

2.8.3 Access to the EPSS.

The EPSS is accessible via the EPSS icon on the left hand side of the Solaris front panel. The icon consists of a WSR-88D Tower and a Question Mark over Pages of Text to the right side of the tower. (See [Figure 2-116](#)) Click on the Icon and the EPSS Index appears.



Figure 2-116. EPSS Icon

2.8.3.1 EPSS Index. The EPSS Index is in alphabetical order with the major topic along the left hand margin and subsets of each topic indented. Scroll through the listings and find the item of interest. Once the desired topic has been found, double click on the title to display the detailing information in a separate screen. The first half page of the index is shown in [Figure 2-117](#).

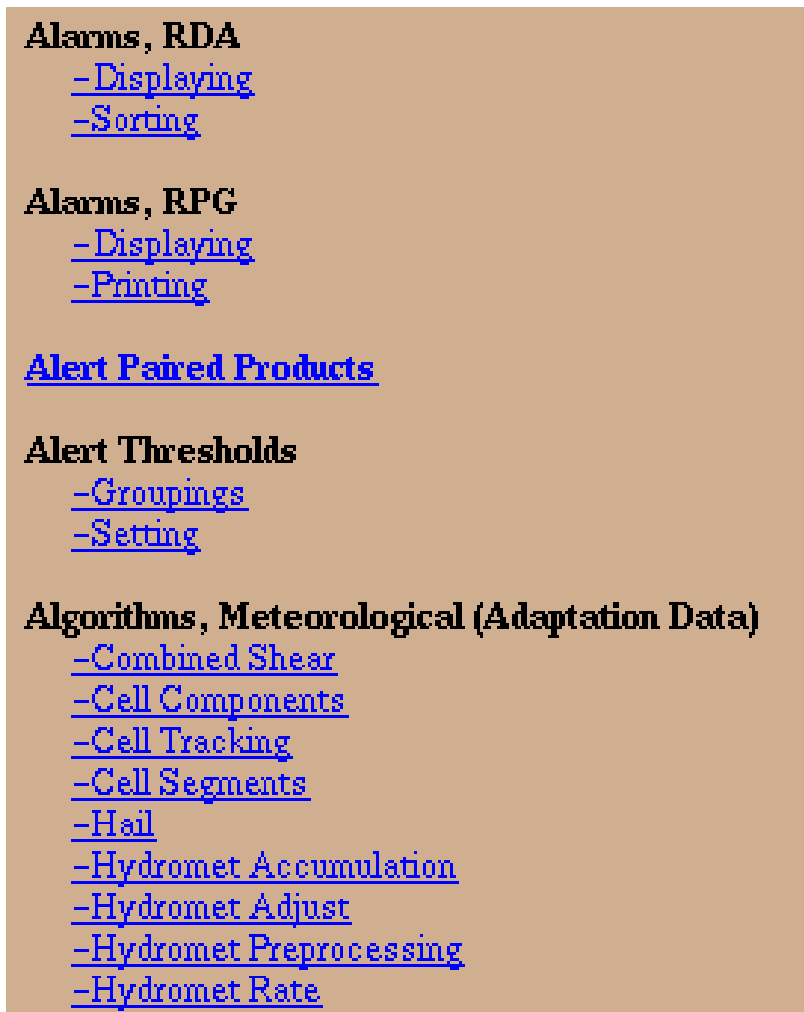


Figure 2-117. EPSS Example

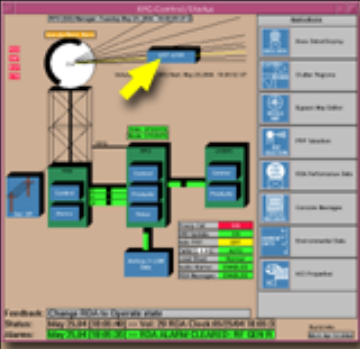
2.8.3.2 Example of EPSS Text. Once a topic or sub-topic has been identified, single click on it with the left button and the EPSS text will be pulled up. The left hand side contains the text, step-by-step instructions, and comments, while the right hand side displays the associated screens, buttons, and figures. At the upper left of the window is a Close Window button. Click on this button to close out the window, or click on the Window Menu button at the top left of the window and select Close. An example of the text for changing VCPs is shown in Figure 2-118.

Volume Coverage Patterns (VCPs) - Changing


Changing to one of four default VCPs:

Changing VCPs involves implementation of one of 4 default VCPs (default VCP 11, 21, 31 or 32) stored at the RDA. The default (aka local) VCPs cannot be modified by the operator. It is important to note that the PER employed within the Doppler cut in the default VCPs are all 7° (maximum unambiguous range of ~90 nm depending on the site's Delta PEI).

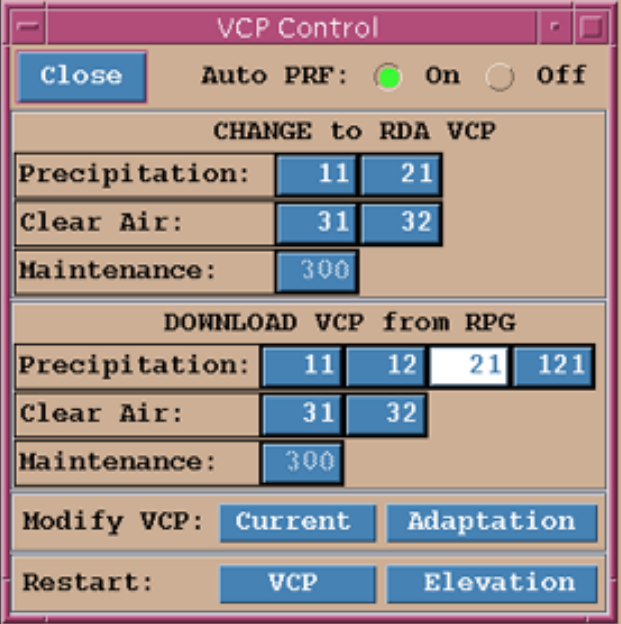
1) At the RPG Control/Status window (HCI main screen), click the VCP button. This action displays the VCP Control window.



RPG Control/Status window - VCP button



VCP button - large view



VCP Control window

CHANGE to RDA VCP				
Precipitation:	11	21		
Clear Air:	31	32		
Maintenance:	300			

DOWNLOAD VCP from RPG				
Precipitation:	11	12	21	121
Clear Air:	31	32		
Maintenance:	300			

Modify VCP: Current Adaptation

Restart: VCP Elevation

Figure 2-118. EPSS Example - Changing VCPs

SECTION 2.9. SECURITY

Security features include physical (gates, locks, guards, etc.), administrative (personnel windowing), and technical (hardware, software, and firmware) attributes sufficient to protect the data stored, processed, or transmitted within the system.

2.9.1 System Security Overview.

The security features for the RPG operating system are specific to UNIX as implemented by Sun Solaris. The site System Administrator personnel require an administrative knowledge of UNIX. Security implementation is based on a preventive approach to system security emphasizing system security, discretionary access control mechanisms, need-to-know, accountability of users (or operators) for their actions, auditing, resource isolation, and configuration management. Properly implemented and monitored, this becomes the first defense against intrusion into and misuse of the system. The system security configuration as implemented uses a combination of automated features and procedural (manual) instructions that are enforced and maintained by the site system administration and security staff.

2.9.1.1 Definition of Terms and Services

2.9.1.1.1 Accountability and Audit. Accountability is the state of the system that enables violators or attempted violators of system security to be identified and held accountable for their actions. Review of system records and activities (audit) test the adequacy of the system controls to ensure compliance with established policy and operational procedures.

2.9.1.1.2 Discretionary Access Control (DAC). DAC is a means of restricting access to objects based on the identity of subjects or groups to which they belong. The user determines who (owner, group, or world) is able to read, write, or execute a system object (files, directories, etc.). Authorized users will only have access to system objects granted by DAC mechanisms. Improperly controlled file access can permit unauthorized users access to information that they do not have a need-to-know and can potentially compromise system security. DAC should not be confused with classification or category designations that are assigned to system information and data.

2.9.1.1.3 Trusted Facility Operations. Trusted Facility Operations refers to the procedures and functions that enforce system security procedures and practices. The ultimate objective of trusted facility operations is to support the system security policy during day-to-day operations. Trusted facility management, in the daily administrative sense, is the responsibility of designated site personnel such as the System Administrators, and is the responsibility of all personnel who enter the facility, physically or logically. Therefore, everyone, particularly system users, should be aware of what constitutes normal operations and what may be misuse of system resources or suspicious or abnormal operating conditions.

2.9.1.1.4 Identification and Authentication (I&A). This security mechanism ensures that only authorized users have access to system resources and that system users are held individually accountable for their actions. Users identify themselves to a system component through their user

ID, which requires authentication by presenting a valid password before permission is granted to access system resources or data.

2.9.1.1.5 Files, Directories, and Permissions. The site System Administrator monitors workstations and servers to verify and maintain the system security configuration. Users must not attempt to load unauthorized software or change file permissions or directories without System Administrator permission. Additionally, users must not change file permissions unless it is within the scope of their job, required for the mission, and they have received proper authorization.

2.9.1.1.6 Antivirus Software. Antivirus software is one security control used to protect the RPG system from macro viruses and other forms of malicious software including Trojans. It is intended to ensure the availability and integrity of the RPG system. Antivirus software is integrated on the RPG, MSCF, and BDDS processors. It is to be used by the System Administrator to capture information about directories and files on transportable media before data is copied to an RPG computer. It is also to be used to capture information about directories and files on RPG computer hard drives if unusual activity on a system is observed. Unusual activity on a system can indicate that the system may have been compromised. The System Administrator should refer to NWS EHB 6-525, paragraph 4-6.10 for scanning steps.

2.9.1.2 Threats and Vulnerabilities. Threats to the RPG System may come in two forms: natural and intended. Natural threats include fire, power failure, environmental failure, etc. Standard safety checks and recovery procedures are established to react to natural threats. Intended threats are human-perpetrated, may occur at any time, and are significantly more difficult to detect. If users suspect or detect misuse, in-progress attacks, or other aberrant system activity, they should immediately contact the site System Administrators or security staff. It is important to report the incident immediately to prevent further possible compromise or damage to the system. Users must be aware that the failure of a single site to ensure security puts all sites at risk.

2.9.1.3 Countermeasures. Local operating procedures are in place for dealing with natural events such as fire, power failure, and environmental malfunctions. To counter intended threats, the RPG System employs safeguard features such as identification and authentication, discretionary access control, accountability, redundancy, auditing, virus scanning, and physical security rules. Each site should develop countermeasure procedures to follow when misuse or system attacks are suspected or detected. When a site has a suspected or actual security incident that compromises the security of the RPG System or the WSR-88D network, they must report the incident to the ROC Hotline immediately to prevent further possible compromise or damage to the system. The site must also report the incident to the NOAA IT Security Office using NOAA Form 47-43 IT Security Incident Report Form. DoD and FAA sites may obtain this form at the following NOAA IT Security Office website:

<https://www.csp.noaa.gov>

Users must be aware that the failure of a single site to ensure security puts all sites at risk. Misuse of the RPG System is illegal and protected under federal and local statutes.

2.9.1.4 Assumptions. The fundamental responsibilities of the system administration or security staff are:

- Understand the system security policy, the certified security configuration requirements, and the security architecture for the RPG System.
- Maintain system security configuration and security services.
- Monitor system activities using audit and security services.
- Identify, investigate, and report abnormal system activities.
- Establish and manage user and group accounts.

2.9.1.5 Separation of Administrative Roles. Only those personnel specifically responsible for site system administrative and security functions have access to system administration accounts. Given the nature of the RPG System and limited site staffing, the same individuals may perform system administration functions as well as system security functions.

2.9.1.5.1 User Requirements. Users are personnel who establish the system requirements and support the WSR-88D mission. Users are the operational users, administrators, and maintainers of the RPG System and components. All users shall comply with RPG system security policies and procedures and shall report security problems. Users must be familiar with the RPG System security policy, the sensitivity and criticality of the data provided by the RPG System, the need for keeping login information private, and to whom they report suspected system anomalies.

2.9.1.5.2 Administrator Requirements. The site System Administrators have the primary responsibility of ensuring that the site complies with security guidance and doctrine, and maintain the security posture of their system. Security policy shall be applied at all sites regardless of size, staffing, or other pertinent qualifiers.

2.9.1.6 System Security Policy. The RPG System Security Policy provides System Administrator guidance for maintaining security of the system, operational controls of the system, life cycle security responsibilities, and documentation. Compliance with the RPG System Security Policy and higher level security policies and procedures is required to ensure the integrity of the system.

2.9.2 Protection Mechanisms Available to Users.

Users must be aware that they are responsible for their actions on the RPG System. Users should notify the site System Administrators of any other security-related issues, misuse, or compromise of the system.

2.9.2.1 System Access. The Common Desktop Environment is automatically started as part of the normal boot process and is configured to run in a multi user, networked environment. Logging into the RPG System environment causes the operating system to create an active session tailored to the user account identified during the login process. The initial session reflects a default set of account, group, and profile attributes that are assigned by the site System Administrators. These attributes determine what the user may access while connected to the system. The user account attributes assigned to a user are:

- User Identification
- User Number
- Password
- Default Profile
- Group Membership

2.9.2.2 Setting Up User Accounts. The site System Administrator provides each new general user with a unique user ID and password.

The following are requirements to be used by System Administrators when setting up user accounts:

- Username must be unique and must not be reissued to another person within a year.
- Passwords will not be distributed via email, voice mail, or answering machine.
- If a user requests a password change due to a forgotten password or because the account has been locked, the System Administrator must personally verify the user's identity before changing the password.
- If access to the system is no longer required by a user, the account must be removed within two days from the last day that access is required.
- User accounts must be reviewed every 6 months to ensure that all active user accounts are valid.
- Inactive accounts will be terminated at 30 days.
- If unauthorized activity is identified in regards to a user account, this account should be disabled immediately.
- If a password has been compromised or is non-compliant then the password must be changed immediately or the account must be temporarily suspended until a password change is made.
- Temporary user IDs and passwords should expire after 14 days.

The following requirements apply specifically to group passwords:

- Must be changed when a member of the group is no longer authorized or when the password has been compromised.
- Must not be used without individual accountability.
- Must not be shared outside of the group.
- Must never be reused.

2.9.2.2.1 Password Requirements for Users. The following password management requirements apply to all users:

- Users are responsible for protecting their passwords against loss or disclosure and will be held liable for any improper use of the password
- A compromised password must be reported immediately to the System Administra-

tor.

- A password must be changed by the user immediately when compromised, possibly compromised, non-compliant with the password policy, or directed by management.
- A unique password must be used for each system accessed. A unique password must be used for each level of access on the same system.
- Password lifetime (also known as password aging) refers to how long a password is valid on the system. The maximum lifetime of a password on the RPG System is 90 days. Users must change their password at least every 90 days.

When the user logs into the RPG System for the first time, the user is required to change the password immediately so that only the user knows the password.

User-generated passwords are required to have the following characteristics:

- Be at least eight characters in length.
- Passwords must contain at least one of each of the following: uppercase, lowercase, number, and special character.
- Six characters of a password may only occur once.
- No null or blank characters may be used.
- No consecutive numbers or letters.
- Users should not use a password that is the same as the USERID or user's name.
- Must not be related to any easily identifiable personal information (such as birthdays, names, etc.) or words that appear in the dictionary, project names, or other acronyms.
- May not be a password that was used within the previous nine password changes.

NOTE

Because UNIX passwords are case-sensitive, users must always enter their password exactly the way they created it. If a user forgets their password, the System Administrators may reset the password for the user to logon and change the password again.

2.9.2.3 Warning Banner (Consent to Monitoring). Users logging into the RPG System should take the time to read and understand the information displayed on the Consent to Monitoring Banner. The banner describes the security nature of the environment, proper behavior while operating in this environment, and the security guidelines defining its operation.

2.9.2.4 Incident Response. Misuse of the RPG System is illegal and protected under federal laws as well as local statutes. The site users are responsible for abiding by applicable policies, guidelines, and directives to ensure they understand what constitutes system misuse. The primary reason for preventing misuse is to ensure that the system configuration complies with security configuration requirements defined in this document. The site System Administrators or security staff can provide specific guidance on security issues that are of concern to the site users.

2.9.3 Protection Mechanisms Available to Administrators.

Administrator accounts shall not be used to accomplish the day-to-day mission work on the RPG System. Each user with administrative duties must have a uniquely identifiable account so that any administrative work can be tracked back to that individual. The root account is reserved for maintenance of the system, and for certain system security-relevant functions. The root privilege must be tightly controlled and given to only those administrative personnel who specifically require the privilege to accomplish their duties and responsibilities. Standard procedure should be to log on as a normal user and then “su” to root.

2.9.3.1 Accountability. System access warning banners are used to notify each user that, by accessing a federal computer system, their actions are subject to review and that they expressly consent to authorized monitoring. The system displays the Consent to Monitoring Banner each time the system boots up and at each login session.

2.9.3.1.1 Identification and Authentication Functions. All RPG System users, including site system administrative users, must enter a valid user identification and password in the Login dialog box to gain access to the system resources.

2.9.3.1.2 Login Parameters. The RPG System employs an interactive, local login (the user database is stored on the operating site RPG System server). When the user enters a unique user identification and password in the Login dialog box, (i.e., username and password), the information is verified against the user account database.

2.9.3.2 Audit. Auditing is one method to monitor the functionality and the effectiveness of security controls, which are set in place to protect the integrity of the RPG System. Auditing of a system captures information about the system and the behavior of users of the system, and stores this information in audit logs. Audit logs preserve a record of system activity, initiated by the system itself, an application used by the system, or user activity. Auditing a system enhances security by providing individual accountability, providing information to reconstruct events, providing intrusion detection capability, and identifying system performance problems.

Auditing is accomplished by several mechanisms on the Sun Sparc computer systems. The RPG computers (i.e., RPG, BDDS, and MSCF) have been tuned to use the standard system logger in conjunction with Solaris' Basic Security Module (BSM) to accomplish system wide auditing activities. The site System Administrator can access the system logs and the audit logs generated by the audit daemon to monitor system activity.

2.9.3.2.1 Activities and Events Audited. The RPG computer systems are configured to audit activities and events to meet DOC, DoD, and DOT security requirements. The principal event classes audited are: login activity, events that are classified as administrative type of activity, and file permissions violations/access denial activity. This is not a complete list of activities logged by the RPG, however these are the more informative events logged from a security perspective.

Login activity is recorded to identify who logs into a system and when they logged in. This information is useful to assist the System Administrator in detecting unauthorized attempts to gain

access to one of the RPG computer systems. All successful and failed logins are recorded so various types of trend analysis can be performed. The login activity file is separated from all the other audit files to assist the System Administrator in monitoring login activity and to make it easier to identify suspicious failed login activity.

Administrative events pertain to activity that require root level privileges. Some examples of such activities are: commanding the system to reboot or shutdown, modifying cron jobs, and adding and managing user accounts. There are many other events that are defined in this class that are not listed here, but this list gives the user an idea as to the type of administrative information being audited.

The file access events are usually kernel events that are initiated by a higher level process. The higher level process can be an application process running as part of the RPG load, or it can be a command or script initiated at the command line by a user. The main activity that is of interest is failed activity, so only failures such as "file access denial" or "permission denial" activity are recorded.

2.9.3.2.2 Runtime Auditing Activity. The audit daemon and system logger start at system bootup and run continuously under normal conditions. The audit daemon has been configured to limit the uncompressed log file sizes to approximately 1.1 MB. When this limit is reached, the audit daemon closes the current log file and opens a new file. The file currently being written to will have the text "not terminated" as part of the filename.

To control the amount of disk space required to retain the audit logs, the log files are compressed and the retention time is limited. A job periodically runs to accomplish both the file compression and purging of aged audit files that exceed the retention time specified by the ROC security personnel. All files purged are permanently deleted and are not recoverable unless site personnel have backed them up.

2.9.3.2.3 How to Access the Audit Logs. Only the System Administrator should need access to the audit log files. The log files are stored in directory `"/var/audit"`. Any files that are compressed (i.e., file name ending in `".gz"`) must be uncompressed using the command `"gunzip"` before they can be viewed. All operations performed on audit logs must be accomplished by the System Administrator.

Files generated by the audit daemon are in non-readable format and can only be viewed using command `"praudit filename"` where filename is the name of the audit file to view. This command converts the log file to readable format and prints the output to screen. To capture the screen contents so that the user can read the output, the command should either be piped to `"more"` or should be redirected to a file. If the output is redirected to a file, the data is written to the file in ASCII format and can be viewed with any text editor.

2.9.3.2.4 How to Access the Login Authentication Log. Login recording is accomplished using the system logger and is logged in file `"authlog"` located in directory `"/var/log"`. This file is in ASCII format and can only be viewed by a `"root"` level user. The file is easy to read, straight forward in its contents, and should be the first log viewed if any questionable activity is suspected on

the system. When a user logs in to the system, the time in which the login occurs is recorded along with user name and the results of whether the login succeeded or failed. Also, if the user logs in remotely, the IP address of where the login attempt is initiated from is recorded.

2.9.3.2.5 Reviewing Audit Logs. Audit logs as defined in this section include the audit logs referenced in paragraph 2.9.3.2.3 and also the Login Authentication Log as referenced in paragraph 2.9.3.2.4. The System Administrator should review audit logs generated by the RPG at least every 28 days. Audit logs should be reviewed immediately if there is any indication that the system may have been compromised.

Audit logs contain valuable information about system and user activities. System configuration can also reveal information about system or user activity. Reviewing audit logs in conjunction with specific system configuration settings can provide an early indication of unusual activities. Unusual activity on a system can indicate that this system may have been compromised. A short list of indications of unusual activity follows:

- Suspicious successful logins and unsuccessful attempts to access the system. This would include frequent failed attempts by a user to access the system that cannot be explained, or login activity by a user who is on leave and should not be accessing the system
- Access to a dormant or obsolete user account.
- Unusual activity by users, such as trying to access files that require “root” privilege or accessing files that would be outside of the realm of normal performance duties.
- Missing audit logs or inconsistent audit logs. The audit logs do not accurately reflect known system activity, which could indicate that the auditing function is not working or has been tampered with. For example, if nothing is has been logged for the last two days, and you know there has been system activity.
- The system clock does not reflect the correct time.
- Unusual system access activity. This would include a change in frequency of access, or repeated unsuccessful attempts to access the system.
- Features or services that should be disabled on the RPG system configuration and are no longer disabled. An example would be the Sendmail feature or Anonymous FTP service has been enabled on the RPG. Both of these should be disabled on a correctly configured RPG Solaris Operating System.

2.9.3.3 Routine Operations.

2.9.3.3.1 Group Accounts. Groups establish a logical grouping of application, menus, and icons that are required to perform a set of tasks. Local accounts utilize the standard UNIX account data bases (e.g., the /etc/passwd and/etc/group files) and only provide access to the system where the accounts are registered.

2.9.3.3.2 Security Relevant Files and Directories. Several directory hierarchies are considered critical to the RPG System and security administration. These hierarchies must be monitored and maintained to ensure that the general user community can neither accidentally or maliciously

cause damage to the system operation by manipulating the key configuration files within them. These directories include:

- /(root) directory is the home directory for the root-user and the parent for all hierarchies in the file system.
- /etc directory is the primary administrative and security directory on the UNIX file system.
- Audit Logs and Online Archives must be protected from unauthorized access or manipulation.

2.9.3.3.3 Establishing User and Group Accounts. The CDE provides an interface for RPG users and workstation management, password control, and administrative functions. To establish or modify a user's identity for the RPG and MSCF processors, use the following procedures. If needing to create a user on a BDDS processor, refer to Table 4-82, NWS EHB 6-525 for the additional steps.

1. Exit the existing CDE screen by clicking on the EXIT button along the bottom Command line, and then confirming the choice on the warning pop-up.
2. Once the US Government Warning window reappears with the edit block for the user name, enter in the name of the super user level for your system. At the next window, enter in the password for the super user level and the CDE screen appears with a terminal window open at the super user level (# prompt).
3. Right click anywhere on the workspace background and the Workspace menu opens. See [Figure 2-119](#).

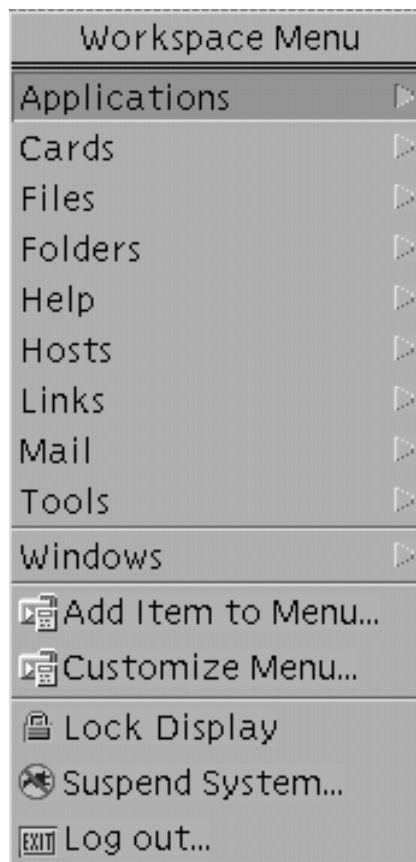


Figure 2-119. Workspace Menu

4. Scroll down the Workspace menu to Tools and click on **Tools**. A secondary menu opens titled Tools. Scroll down the Tools menu to Admintools and click. This opens the Admin-tool: Users window. See [Figure 2-120](#).

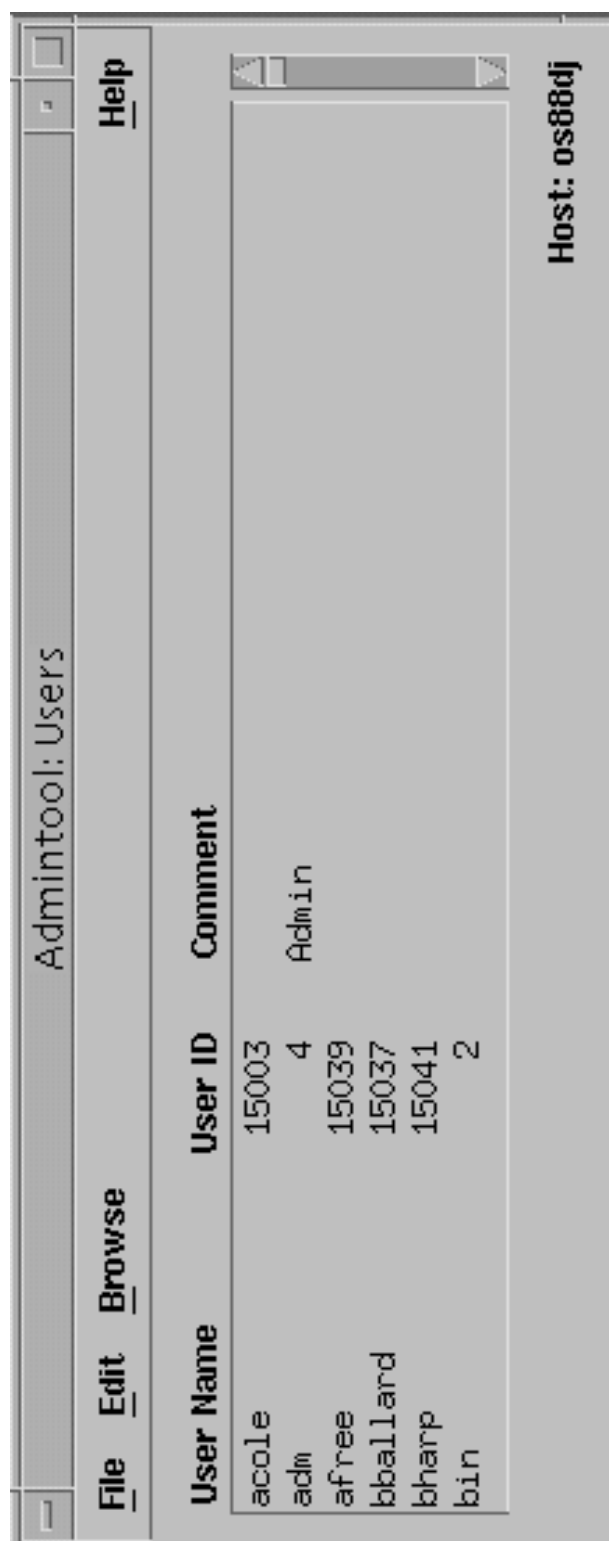


Figure 2-120. Admintool: Users

5. Click on **Edit**, and a pull down menu appears. See [Figure 2-121](#).

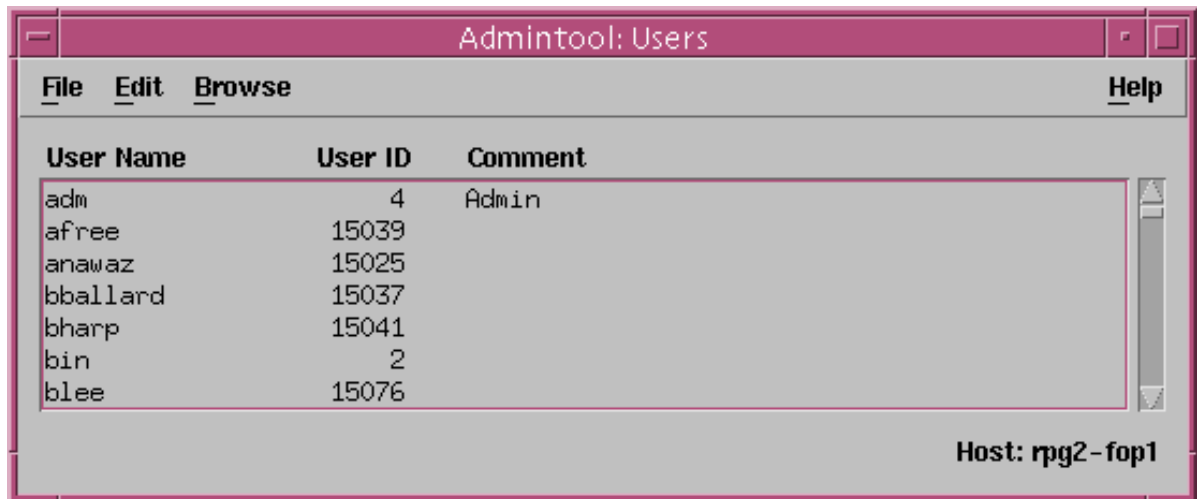


Figure 2-121. Admintool: Users Edit

6. Click on **Add**, and the Admintool: Add User window opens. See [Figure 2-122](#).

Admintool: Add User

USER IDENTITY

User Name:

User ID:

Primary Group:

Secondary Groups:

Comment:

Login Shell: /bin/sh

ACCOUNT SECURITY

Password:

Min Change: days

Max Change: days

Max Inactive: days

Expiration Date:

(dd/mm/yy)

Warning: days

HOME DIRECTORY

Create Home Dir: ☐

Path:

OK Apply Reset Cancel Help

Figure 2-122. Admintool: Add User

7. Under the section labeled **USER IDENTITY**, using the keyboard, enter the:
 - User Name in the User Name field
 - User ID in the User ID field. (Use the default ID number or assign a unique ID. Use only ID numbers between 1001 and 20,000.)
 - Group name of "101" in the Primary Group field. (The name "101" is the RPG group.)
 - User's name, job title, or any other pertinent information maintained on the user in the Comment field (Optional).
8. Position the cursor on the right hand button of the Login Shell: edit field. Click on the button, and four options appear (Bourne, C, Korn, or Other). Click on the "C" option, and the C shell will then be listed as the Login Shell.

9. Under the section labeled ACCOUNT SECURITY, position the cursor on the right hand button of the Password: edit field. Click on the button, and four options appear (Cleared until first login, Account is locked, No password--setuid only, and Normal Password...). Click on the Normal Password... option, and that opens up the Set User Password window. See [Figure 2-123](#).

The screenshot shows the 'Admintool: Add User' window. The 'ACCOUNT SECURITY' section is active, and the 'Password:' field has a dropdown menu open showing four options: 'Cleared until first login', 'Account is locked', 'No password -- setuid only', and 'Normal Password...'. The 'User Name:' field is empty, 'User ID:' is '1004', 'Primary Group:' is '10', 'Secondary Groups:' is empty, 'Comment:' is empty, 'Login Shell:' is 'Bourne' with a dropdown arrow, and the shell path is '/bin/sh'. The 'Max Inactive:' field is empty with a dropdown arrow and 'days' next to it. The 'Expiration Date:' field has three 'None' buttons with dropdown arrows. The 'Warning:' field is empty with a dropdown arrow and 'days' next to it. The 'HOME DIRECTORY' section has a 'Create Home Dir:' checkbox and an empty 'Path:' field. At the bottom are buttons for 'OK', 'Apply', 'Reset', 'Cancel', and 'Help'.

Figure 2-123. Account Security Password Options

Type in the password in the Enter Password: edit field, press the **Tab** key, type in the same password in the Verify Password: edit field, and then click on **OK** to have the password accepted.

10. Still in the ACCOUNT SECURITY section ([Figure 2-122](#)), using the keyboard, enter in:

- Min Change: Optional (Suggest leave blank)
- Max Change: "90". Maximum number of days for the user to use the same password. This is recommended to be 90 days.
- Max Inactive: "30". Maximum number of days that an account can be inactive should be 30 days.
- Expiration date: "14". Maximum number of days that a temporary password can exist should be 14 days from the current date.
- Warning: "5". Number of days for the user to be prompted to change their password. This is recommended to be 5 days.

11. In the HOME DIRECTORY section, in the edit field to the right of the title Path: enter the following information: `/export/home/user_name <Return>`. (For individual user accounts, the user_name is the same that was inserted in step 7, first entry.)

12. Click on the OK window, the desired changes will be accepted, and the Admintool: Add User window will be closed.

13. At the Admintool: Users window, under the File button, click on File, Exit. This exits the operator from the Admintool: Users window.

14. At a terminal window super user # prompt, enter: `cd /export/home<Return>`. This changes to the home directory location of all users, including the applications software user account.

15. At the # prompt, enter: `ls -l<Return>`. Note the present version account name for the RPG or MSCF applications software (e.g. v1.15 or v1.5).

16. At the # prompt, enter: `cd version_acct<Return>` where version_acct is the applications software name observed in the previous step.

17. Step 17. At the # prompt, enter: `./update_users<Return>`. This automatically updates all users' cshrc files as required to run the applications software and also adds any new user IDs.

18. Close out the CDE window by clicking on the **EXIT** button and confirming exit on the pop-up warning. Once the US Government Warning window reappears with the edit block for the user name, enter in the name of the normal user for your system. At the next window, enter in the password for the same normal user, and the CDE screen appears with a terminal window open at the normal user level.

2.9.3.3.4 Changing/Modifying User Account and Password. System administrators, refer to step 8 above. In the Admintool: Add User window, under ACCOUNT SECURITY. If a users account is to be locked, using the pull down menu next to Password, choose the Account is Locked option.

Click on the Apply button on the bottom of the window, then click on the OK button. To unlock the account, choose the Normal Password and follow steps 9 through 12 above.

2.9.3.3.5 Changing User Passwords. Users are required to change their initial password at their first login to the system. Users will then be required, depending upon the site setup, to change their password at least every 90 days. To remind each individual user, a separate prompt will start appearing five days before the password is to expire, and will continue to count down each day until the last day, and then hourly the last 24 hours.

If a user suspects their password has been compromised, notify the site System Administrator and change their password immediately.

Each user can change their password at the regular Terminal window by performing the following steps:

1. Click in the terminal window to activate the blinking cursor at the : prompt.
2. At the : prompt, enter: **exit<Return>**
3. At the : prompt, enter: **passwd<Return>**
4. The following two lines of text will appear:


```
passwd: Changing password for XXXXXXXX (XXXXXXX is user name)
Enter login password:
```
5. At the Enter login password: prompt, type:
AAAAAAA<Return> (AAAAAAA is your current password)
6. Next text line will read:
New password:
7. At the New password: prompt, type:
BBBBBBBB<Return> (BBBBBBBB is your new password)

NOTE

The new password must differ by at least 3 positions, and it must meet the requirements specified in paragraph [2.9.2.2.1](#). If an invalid password is entered, another text line will appear that reads: "passwd (SYSTEM) with a comment as to the problem encountered. Examples of comments are: Password too short - must be at least 8 characters and Passwords must differ by at least 3 positions. The prompt: New password: will then reappear. If the comment: Too many failures - try later appears, that means that the user made more than three attempts and must start over. Enter **Exit<Return>** and return to step 2 of these procedures.

8. Next text line will read:
Re-enter new password:
9. At the Re-enter new password: prompt, enter:
BBBBBBBB<Return> (BBBBBBBB is still your new password)
10. If the new password has been successfully entered, the next two text lines will read:
passwd (SYSTEM); passwd successfully changed for XXXXXXXX
2 rpg-site /export/home/XXXXXXXX :

NOTE

If the new password was not successfully entered, the next two text lines will read:
passwd(SYSTEM): They don't match; try again.
New password:
(Return to step 7 and enter your new password again.)

11. At the : prompt, enter:
csh<Return>

The user will be returned to their regular prompt with the new password in effect. If the MSCF was closed down, at the : prompt, enter: **mscf &<Return>**.

2.9.3.3.6 Changing File Permissions. The site System Administrators must ensure that user permissions set on home directories conform to the least privilege concept. System administrators and users must understand that the permissions on objects or files created may restrict access exclusively, to the owning user and creator of that object or file. Sharing objects or files within the users home directory requires that permissions on the directory allow another user access to the specific objects.

There are three types of permissions associated with a user's files and directories:

- r - read the file or directory.
- w - write to the file or directory.
- x - execute the file or search the directory.

These permissions can be set for three types of users:

- o - the owner of the file(s).
- g - the members of the group to which the owner belongs.
- w - all other users.

File management is a feature provided through the CED interface. To change file permissions on user controlled files, take the following steps:

1. Click on the File Manager icon. See [Figure 2-124](#).



Figure 2-124. File Manager Icon

2. The File Manager - XXX window opens. See [Figure 2-125](#).

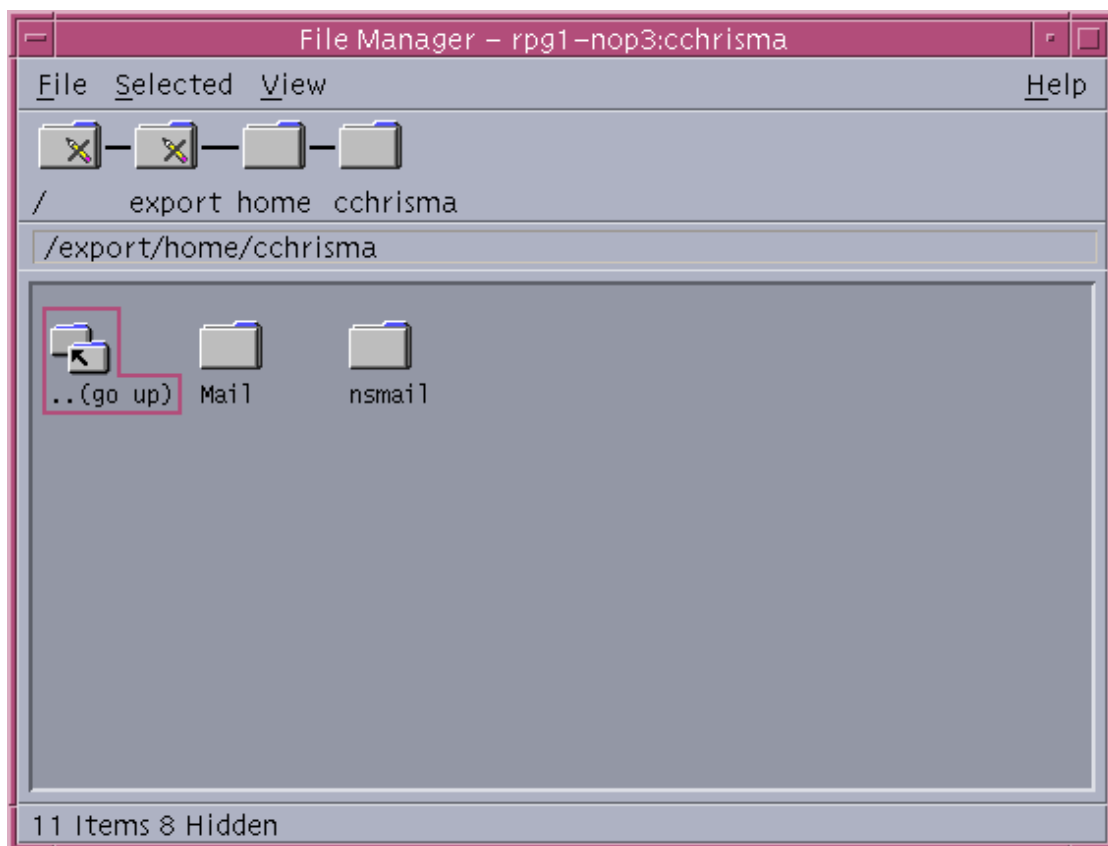


Figure 2-125. File Manager

- Step 3. Click on the file in the center of the window whose permission are to be changed. The file will be highlighted. Then click on the **Selected** command. A pull down menu opens. See [Figure 2-126](#).

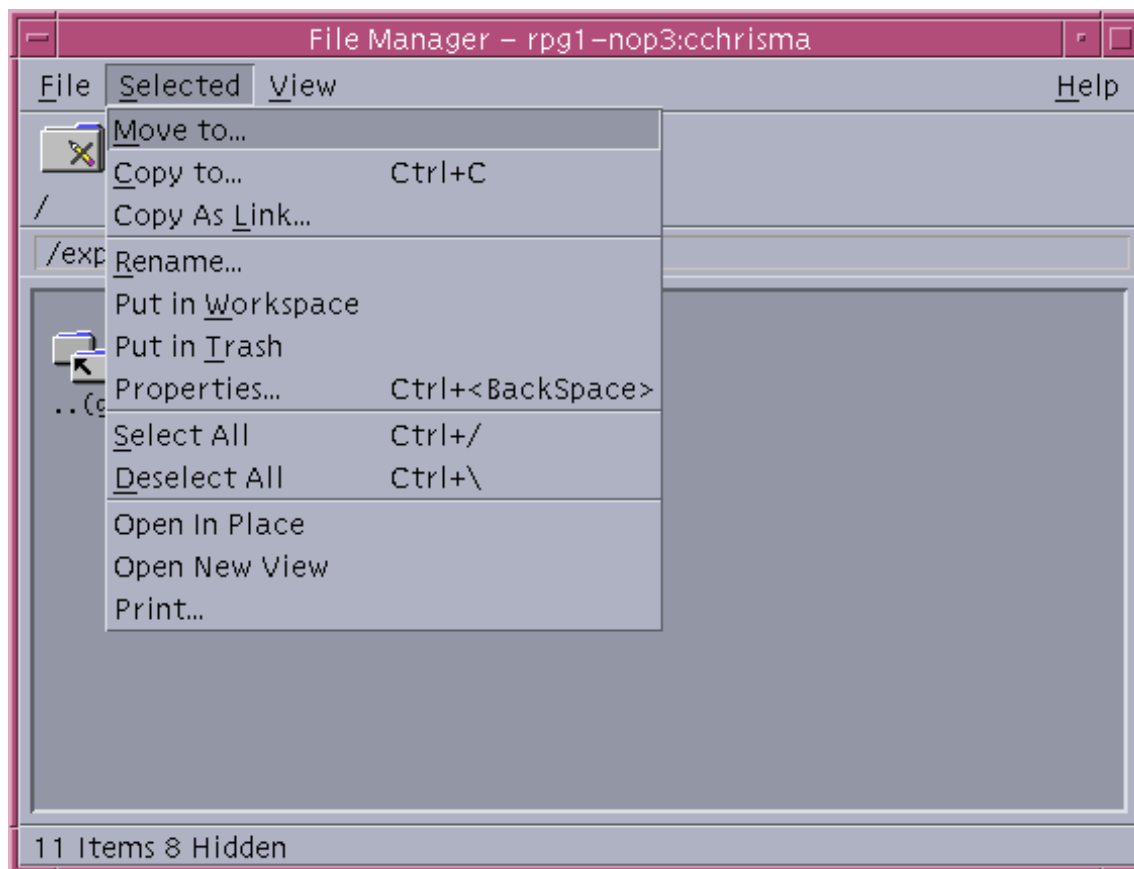


Figure 2-126. File Manager - Selected Menu

- Click on the Properties option, and the Properties - XXX window opens. XXX represents the file that was highlighted in Step 3 above. See [Figure 2-127](#).

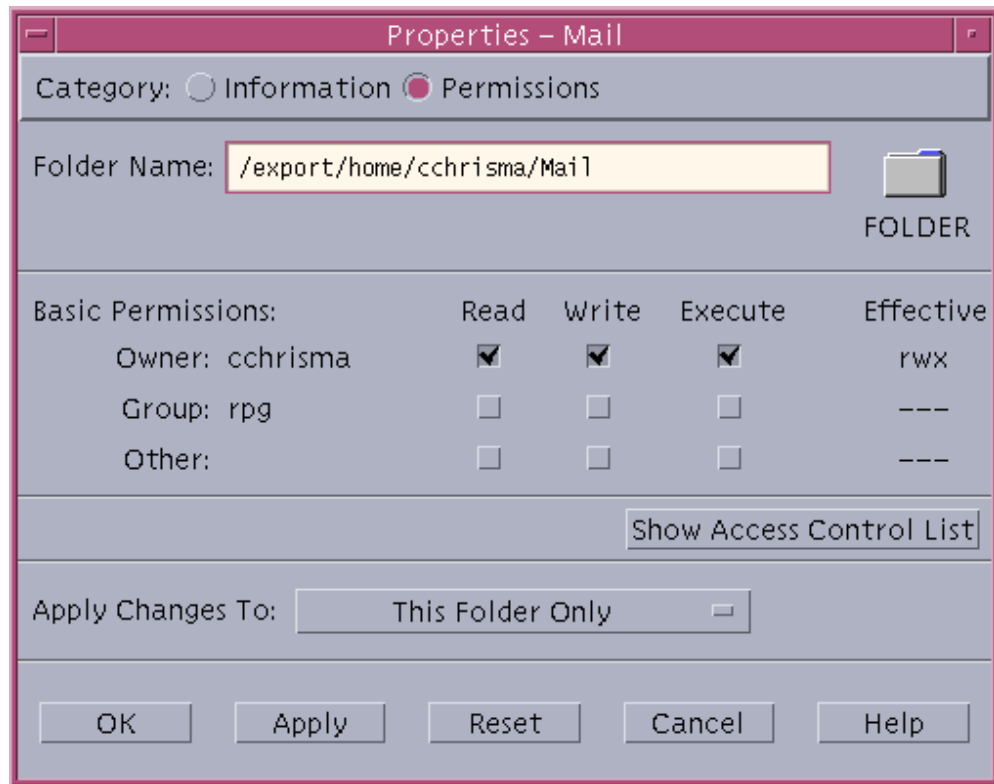


Figure 2-127. Properties - XXX

5. Click on the basic permissions that are to be changed. Then click on OK to accept these changes and to close the window.

An alternative way to open the Properties window and browse through all the files is the following:

1. Right click anywhere on the workspace background and the Workspace Menu opens. See [Figure 2-119](#).
2. Step 2. Scroll down the Workspace Menu to Files and click on Files. A secondary menu opens titled Files. Scroll down the Files menu to Properties and click. This opens the Properties - (None) window. See [Figure 2-128](#).

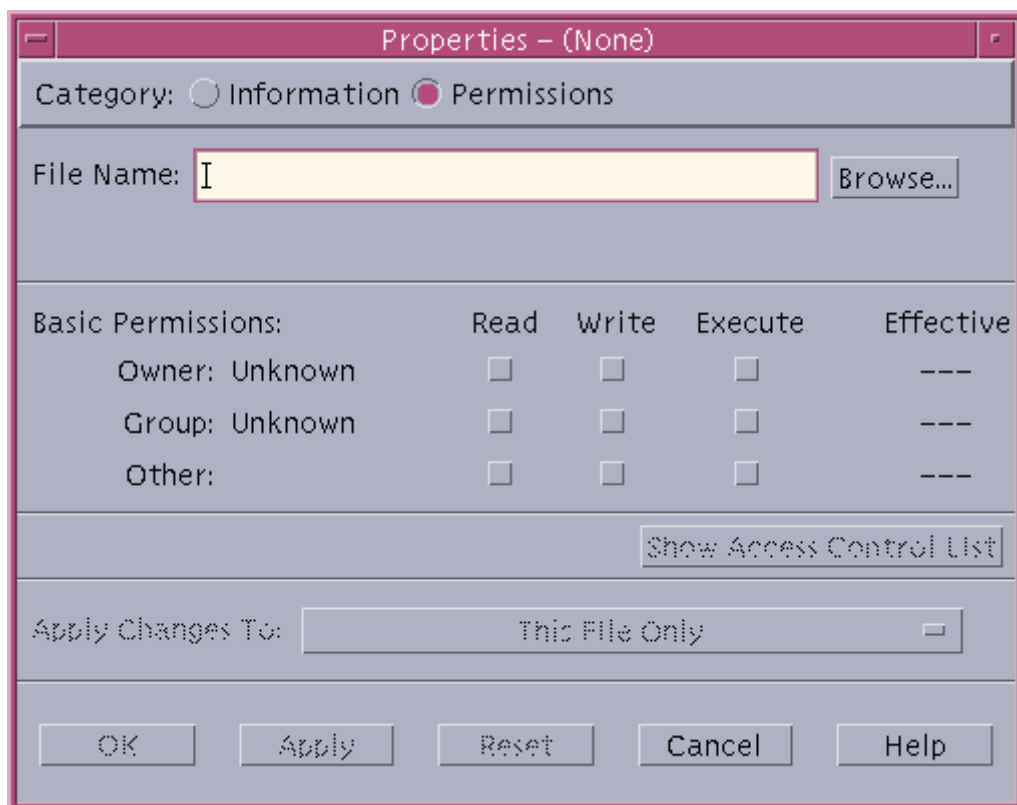


Figure 2-128. Properties - (None)

Step 3. To browse through the files that may be selected, click on the **Browse** button to the right of the File Name: editable field. This opens the File Selection window. See [Figure 2-129](#).

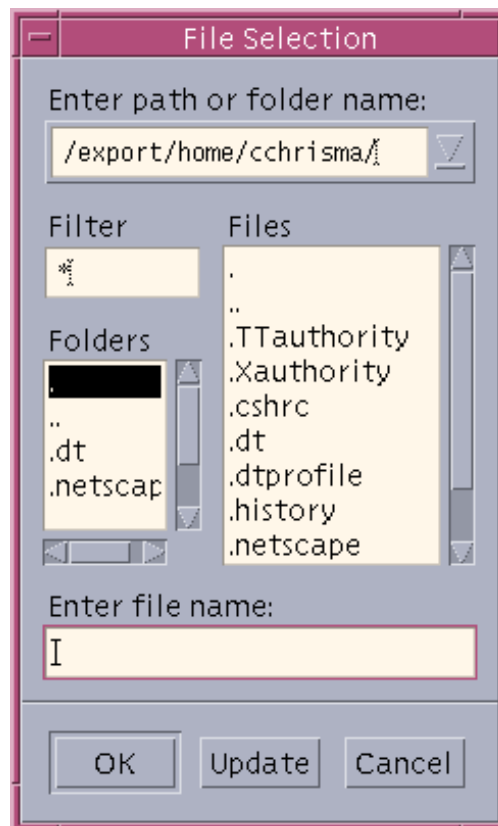


Figure 2-129. File Selection Dialog

Step 4. Select the file desired by using the options available in the window, then click on OK to transfer the file to the Properties window and close the File Selection Dialog window.

Step 5. Click on the Permissions desired, then click on **OK** to accept these changes and to close the window.

SECTION 2.10. SYSTEM BACKUP

2.10.1 JAZ Storage Device.

The RPG uses an Iomega JAZ Storage Device connected directly to the RPG processor for creating backup copies of system software.

2.10.1.1 Formatting Blank JAZ Disks. Before a JAZ disk can be used for or for copying software, it must be formatted. Use the MSCF JAZ drive.

NOTE

Formatting a disk with data on it will cause the data to be lost.

To format a JAZ 2GB disk cartridge, follow the steps in the following table.

Table 2-4. Formatting JAZ 2GB Disk Cartridge

STEP	ACTION/RESPONSE	COMMENTS
1	Insert a blank JAZ 2GB disk cartridge in the MSCF drive.	Loads the blank disk cartridge.
2	Click on a terminal window at the MSCF. At the normal user prompt, enter: su<Return> and then root-password<Return>	This takes the user to the superuser level. If not allowed, contact the System Administrator for assistance with this procedure.
3	At the # prompt, enter: newfs -i 5885 -f 4096 -v /dev/rdisk/c1t3d0s2 When prompted with the question: Do you want to construct a new file system...? enter: y <Return>	This creates a new file system on the JAZ disk cartridge. Perform this only one time for each JAZ disk cartridge. Length of time: Less than two (2) minutes Response to see once finished: Command Prompt: # returns.
4	At the # prompt, enter: jazmount<Return>	The jazmount script will mount the Jaz disk to the /jaz mount point, update the group ID, and update the permissions for the mount point. It takes approximately 20 seconds.
5	At the # prompt, enter: umount /jaz<Return>	Unmounts the Jaz disk cartridge from the mount point.

Table 2-4. Formatting JAZ 2GB Disk Cartridge (Continued)

STEP	ACTION/RESPONSE	COMMENTS
6	At the # prompt, enter: mount<Return>	There should be no line showing a mount for: /jaz on /dev/dsk/ c1t3d0s2... This proves the Jaz disk did correctly unmount. If it is still mounted, repeat step #5.
7	Press the button on the MSCF JAZ disk drive to eject the disk cartridge.	The disk cartridge is ejected.
8	Label the disk with the date it was formatted and its purpose:	EXAMPLE: Formatted April 15, 2001. Archive III, KCRI, Start:
9	At the # prompt, enter: exit<Return>	This exits the superuser mode.

The disk is now ready to use. Automount will start and mount the JAZ disk properly.

2.10.1.2 Non-formatted Disk. If a non-formatted JAZ disk is inserted into the JAZ drive, the message back to the operator will be "Mounon not successful."

2.10.1.3 Formatting a JAZ Disk at the RPG Drive and Other Options. An alternate procedure is available to the operator to format a Jaz disk at the RPG drive. It is not the preferred method but is an option. The method is more detailed and is explained in NWS EHB 6-525.

Other options that may be needed to format a Jaz disk if the above steps do not format the disk can also be found in the NWS EHB 5-525. There are three different tables with supplemental information about each.

2.10.2 JAZ Disk.

The JAZ Storage Device uses a disk for backup. Each JAZ disk has the capacity to store 2 Gigabytes (2,000 Megabytes) of data.

2.10.2.1 JAZ Disk Insertion. Take the Iomega JAZ disk, hold it with the label up, spindle on bottom, and front curved edge facing the drive. Slide it gently into the empty slot in the drive until the disk is secured and pulled in the rest of the way by the internal mechanism of the drive.

If the disk is not accepted by the drive, contact maintenance to check out the drive.

2.10.2.2 JAZ Disk Removal. If the amber light is flickering, that means there is data being transferred and the drive is mounted. The JAZ disk should be unmounted before removing the disk (umount /jaz).

Once it is unmounted, the disk should automatically release from the drive and push out approximately one-fourth of the way out of the slot. The user can still unmount the disk manually by pushing on the button to the right of the disk drive slot. Gently pull straight out to remove the disk. Write on the label the information that has been placed on the disk. Place it in the protective case and store it in a suitable location.

CHAPTER 3

OPERATIONAL CONSIDERATIONS

SECTION 3.1. INTRODUCTION

3.1.1 Scope of Operational Considerations.

This chapter provides reference information for the operator. The chapter is divided into the following sections:

- Section 3.1. - INTRODUCTION
- Section 3.2. - RPG DATA PROCESSING
- Section 3.3. - LOAD SHEDDING
- Section 3.4. - ADAPTATION DATA
- Section 3.5. - VOLUME COVERAGE PATTERN
- Section 3.6. - VOLUME COVERAGE PATTERN (VCP) CHANGES AND AUTOMATIC PRF SELECTION.
- Section 3.7. - SELECTION OF PRODUCT PARAMETERS
- Section 3.8. - CLUTTER REGIONS
- Section 3.9. - BYPASS MAP EDITOR
- Section 3.10. - ENVIRONMENTAL DATA
- Section 3.11. - PRECIPITATION DETECTION FUNCTION

SECTION 3.2. RPG DATA PROCESSING

3.2.1 Introduction.

Data processing in the RPG functional area is accomplished in the RPGPCA cabinet. Data is received over the wideband communications link from the RDA functional area and over the narrowband communications link to the Associated and Non-Associated Users. The data received from the RDA is the base data consisting of Reflectivity, Velocity, and Spectrum Width. Request for products and data are received from the associated and non-associated users for the RPG to handle and process. The HCI controls the processing of the data in the RPG. A brief description of the following interrelated functions of the RPG are discussed in subsequent paragraphs:

- RPG Processor
- Wideband Communications
- Narrowband Communications
- HCI

NOTE

For further information refer to the Federal Meteorological Handbook, Number 11 (FMH-11).

3.2.2 RPG Processor.

The RPG processor function provides product generation, local storage, distribution control, and archiving of selected base and derived products, data arrays, and status data. It controls the RDA operating modes and monitoring of the operational status of the overall WSR-88D unit. The RPG processor receives the following data from the RDA:

- RDA Status Data
- Digital Radar Data
- RDA Performance Maintenance Data
- Console Messages
- Loopback Test
- Clutter Filter Bypass Map

The processor stores this data until it is accessed and transferred. The processing equipment transfers the data from memory, processes the base data, and converts it into weather products. These products are then stored on mass storage. The processor responds to requests from the RDA, associated and non-associated users, River Forecast Centers (RFCs) and other users. The RPG processor also transmits the following data to the RDA functional area:

- RDA Control Commands
- Volume Coverage Patterns
- Clutter Suppression Regions
- Requests for Data
- Loopback Tests
- Edited Clutter Filter Bypass Map
- Console Messages

3.2.3 Wideband Communications.

The wideband link receives base data and status from the RDA and passes it to the memory of the RPG processor. The wideband communication medium may be microwave line of sight or hardwire (collocated), private T1, or commercial (TELCO) T1. Command and control data is also passed over the wideband communication link from the RPG to the RDA data processor.

3.2.4 Narrowband Communications.

The narrowband communications link receives selected base/derived products, status and alert messages for distribution from the RPG and sends them to the designated units. The RPG also receives the requests from designated units over the narrowband lines for processing.

3.2.5 HCI.

The HCI is a software application that is the man/machine interface that provides control over the processing functions by permitting the selection of products to be routinely generated and a product subset to be archived.

SECTION 3.3. LOAD SHEDDING

3.3.1 Introduction.

The RPG software is designed to handle a larger load than a standard hardware configuration would support normally. Additionally, this software is designed to prevent an overloaded condition. The categories for which the operator can, to some extent, monitor and/or control the load include:

- CPU
- Distribution
- Product Storage
- RDA Radial
- RPG Radial

There are two direct types of operator control for overload: product priorities and category utilization. Indirect controls are available primarily through product request and generation selection. Load control is tailored for each of the categories in a different manner. Product generation includes routinely generated products through the Product Generation and Distribution List, Associated Users/Collocated Users Routine Product Set lists, one time requests, and products selected for alert based generation.

3.3.2 CPU Load Control.

CPU load control is applied as product requests are scheduled for generation. Products scheduled for routine generation are generated in a product priority order. Products may be prioritized at the HCI under the RPG Products, Load Shed Products window on a product-type by product-type basis. Table 3-1 is an example for illustrative purposes which contains two columns of data (Range and Mnemonic) which are not present on the operational RPG Product Priority (Load Shed Products) window.

As products are scheduled for generation in priority order, the projected loading is accumulated until such time as the utilization for the CPU category is exceeded. When this occurs, scheduling of product requests for generation is terminated and any products remaining to be generated are CPU load-shed. From volume scan, to volume scan the CPU utilization is measured and updated.

For example, 16 data level .54 nm resolution reflectivity products may have one priority assigned while 8 data level .54 nm resolution reflectivity products may have another priority. If the 8 data level version has a higher priority, it will be scheduled in preference to the 16 data level version.

Replay products (e.g., products generated from data stored within the last two volume scans in response to one time requests) which are scheduled in groups from one time requests are treated in a similar manner.

3.3.2.1 HCI Operator Control.

The HCI operator can make inputs of product loadshed priorities on the Load Shed Products window where lower priority number corresponds to lower priority product generation. Indirect controls include selection of background loading on the RPG such as the selection of products from the Users window, RPG User Profile Editor, for distribution to all other users and classes of users.

3.3.3 Distribution Load Shed.

Distribution overload occurs when the loading on the RPG causes base data to back up in the RPG input buffers. When the backup is projected to exceed an alarm threshold set at the HCI, Load Shed Categories window, in the lower right corner of the HCI, products are shed in priority order to avoid loss of data base.

RPG software consists of a number of processing tasks. Some of these tasks directly produce products from base data while others produce intermediate output which is ultimately used to produce products. Some examples of this are shown in the diagrams in [Table 3-1. Expanded Version of Load Shed Products Window](#). This example also illustrates three processing tasks which produce base products.

In this example, the BASRFLCT and BASVLCTY tasks respectively produce six base reflectivity products and six base velocity products, each of which differs in range, resolution, and data level. The VILETALG task is the processing task which produces the volume-based products ETPRODD and VILPROD.

In order to alleviate an input buffer overload, some processing tasks must be shed. Product priorities at the HCI Load Shed Products window will be used to select products for shedding until all outputs of a given task are shed and hence the task is shed.

Figure 3-1 shows the Load Control Processing Tasks. If the input buffer utilization level exceeds the alarm level, shedding will occur. The priority settings are described in the following table.

Table 3-1. Expanded Version of Load Shed Products Window

Product	Resolution (nm)	Data Level	Range (nm)	Priority Mnemonic	Priority (unitless)
R	.54	8	124	BREF16	80
R	1.1	8	248	BREF17	80
R	2.2	8	248	BREF18	79
R	.54	16	124	BREF19	78
R	1.1	16	248	BREF20	77
R	2.2	16	248	BREF21	50

Table 3-1. Expanded Version of Load Shed Products Window (Continued)

V	.13	8	32	BVEL22	76
V	.27	8	62	BVEL23	75
V	.54	8	124	BVEL24	74
V	.13	16	32	BVEL25	73
V	.27	16	62	BVEL26	72
V	.54	16	124	BVEL27	71
ET	2.2		124	ETPRODD	65
VIL	2.2		124	VILPROD	63

BREF21 is selected first for potential shedding. The BASRFLCT task itself is not yet shed. Next VIL and ET product types are selected for shedding. Assuming algorithm output is not required for SWP or alerting, this is adequate to shed the VILETALG task which does consume base data. The downstream tasks: ETPRODD and VILPROD, are also terminated. Since VILETALG is a task which produces volume-based output, processing is terminated for this task for the entire volume scan. If this shedding is adequate to lower the projected input buffer utilization below the warning level, no more shedding occurs. In this case, note BREF21 will be produced since the BASRFLCT task was not shed.

If projected utilization is not reduced below the warning level, BVEL27 through BVEL22 are selected for shedding in that order, which leads to shedding of the BASVLCTY task. Since this task produces elevation-based output, the task is shed only for that elevation. All the base velocity products in that specific elevation angle (products 22 through 27) are load shed and they will not be generated. If this shedding is adequate to lower the projected input buffer utilization below the warning level, no more shedding occurs. In this case BREF21 will be produced since the BASRFLCT task was not shed.

A parameter in the startup file for the RPG is available to increase the amount of buffer space available for input buffers. The primary tradeoff is between input buffer and memory load shedding. As more space is reserved for input buffers, less space is available for product generation. It should be noted that expanding the buffer space can lead to degraded throughput, because as the base data backs up, processing is delayed. The probability of memory loadshed can be reduced through increased utilization of memory reserve and expansion.

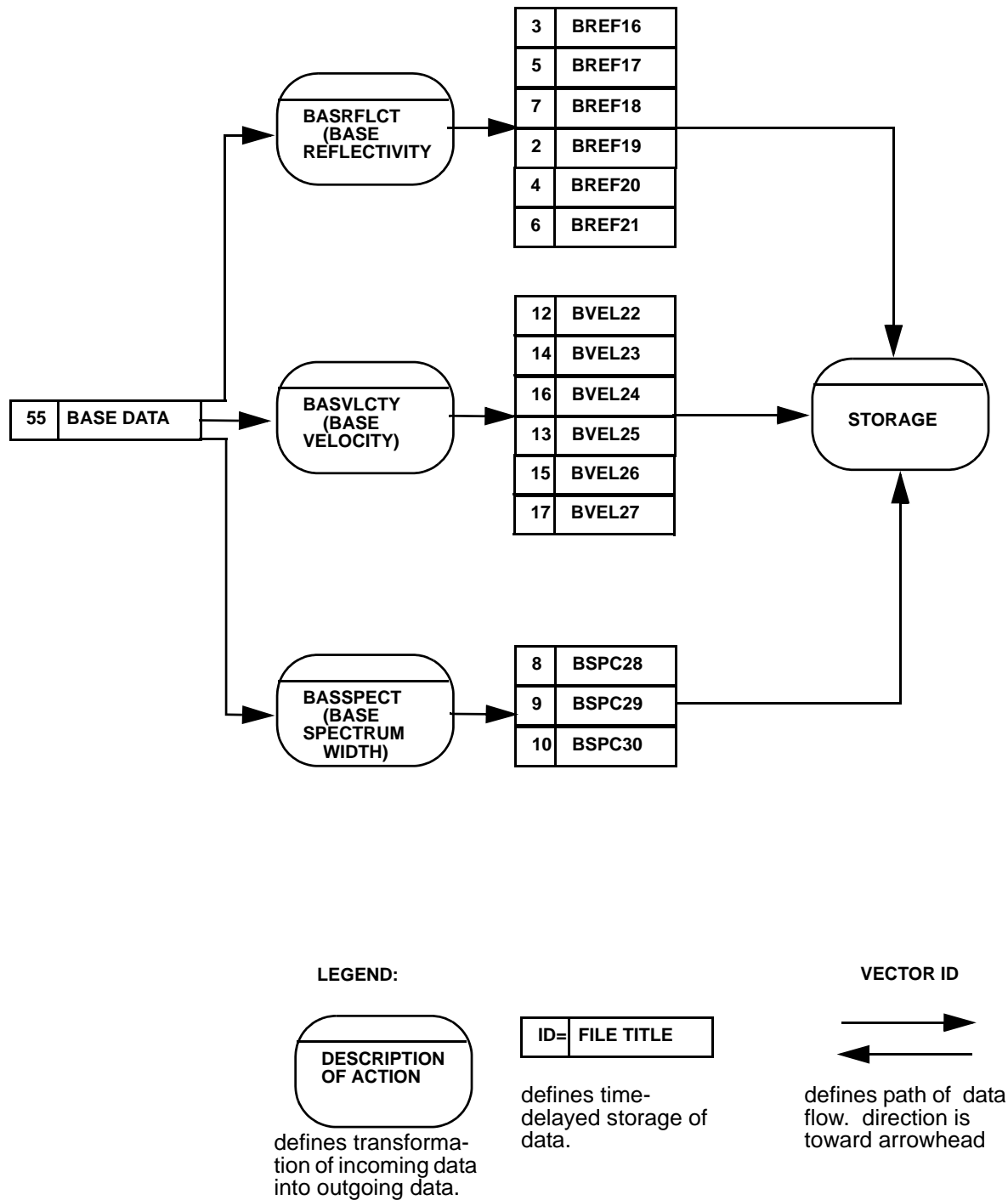


Figure 3-1. Load Control Processing Tasks (Sheet 1 of 2)

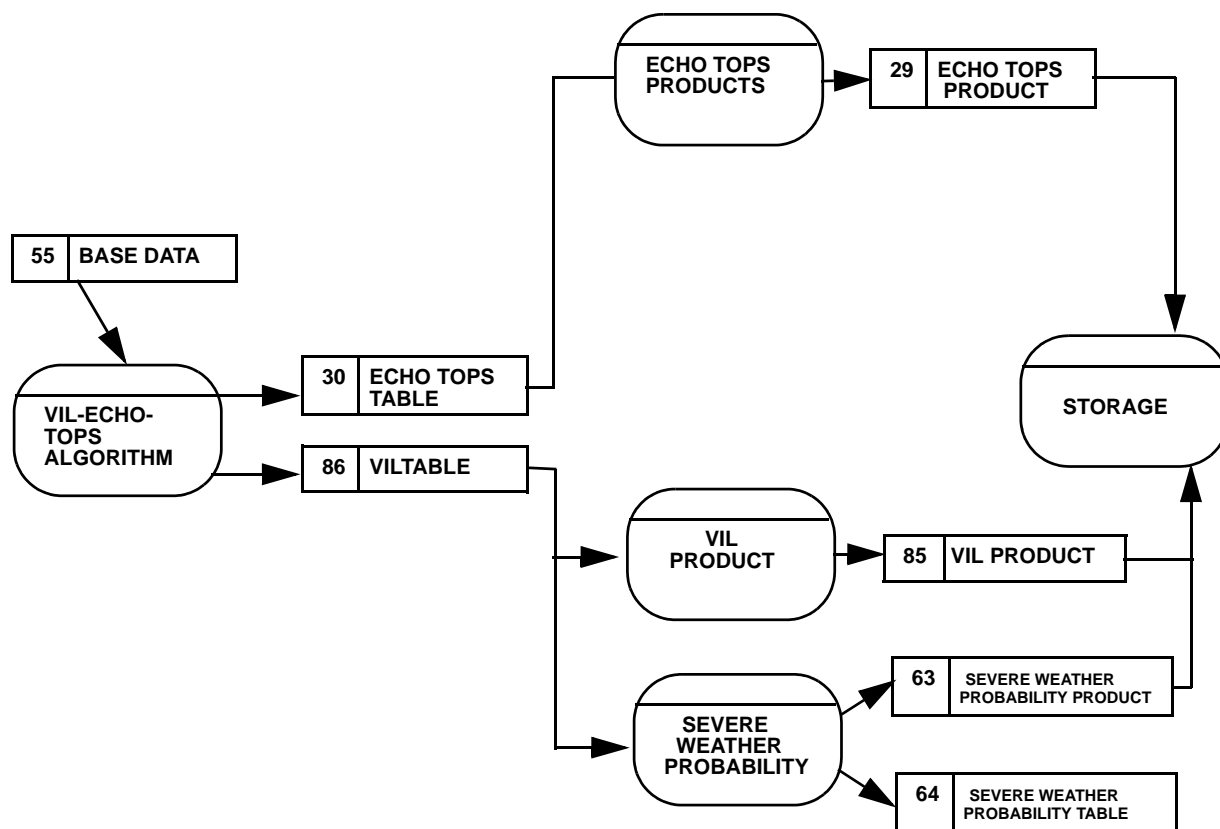


Figure 3-1. Load Control Processing Tasks (Sheet 2 of 2)

3.3.3.1 HCI Operator Control. Direct controls are based on product loadshed priorities at the Load Shed Products window and selection of warning and alarm levels at the Load Shed Categories window by the HCI operator. The parameter controlling buffer space is currently set to 27 to achieve a balance between memory and input buffer loadshed. A maximum value of 40 allows backup of a full elevation. For purposes of input buffer load control it makes sense to group product priorities on a task basis. Assigning lower priorities at the HCI to heavy processing task products (e.g., shear contour and layer composite turbulence) provides for more effective load control.

Indirect controls are based on distribution load shed for primarily routine product generation as selected at the HCI and associated users. Secondary controls are based on one time product generation through alert product pairing and associated users, and through direct requests, distribution of products and alert product selection to non-associated users. Additional, volume coverage pattern selection impacts input buffer utilization. A higher data rate (e.g. VCP 11 which is 14 elevations in 5 minutes) increases the probability of load shedding.

The above guidelines will vary depending on product loading, volume coverage pattern selection and, to a lesser extent, the weather conditions.

3.3.4 Product Storage Load Shed.

Product storage load control is provided for the product data base. This data base is used to store products generated by the RPG. Since the disk space is dynamically allocated for product storage, this type of load control is needed to provide some control over the utilization of the product data base. Although the amount of disk space allocated for product storage is fixed, individual product space is not specifically reserved. Thus, whatever disk space a product requires, dependent upon its size, will be accommodated. The controls available for this type of loadshedding are limited to selections on the Loadshed Categories window. These selections are Warning and Alarm percentage utilization.

All radar products are stored in the product data base and retained for a period of approximately two volume scans. Further, a retention time can be specified at the HCI under the RPG Products window, Generation List, RPG Product Generation Table Editor, Column Six: (mins), ranging up to 360 minutes. When the amount of data in the product data base exceeds the warning level as specified on the Loadshed Categories window, a warning message is issued. When the amount of data exceeds the alarm level, a load shedding procedure is automatically activated. The procedure involves deleting the oldest products in the data base until the amount of data goes below the warning level. Once this occurs, the procedure is terminated.

3.3.4.1 HCI Operator Control. It is recommended to set the alarm level high (e.g., to approximately 95%) and to set the warning level to a significantly lower setting (e.g., 60%). The higher setting allows storage of a larger amount of data, while the larger spread between warning and alarm prevents rapid cycling between an overload/underload situation. Raising the warning level may be appropriate to reduce nuisance warning messages. Alarm level selection to less than 100% provides some space while the load shed procedure is invoked.

Upon receipt of a warning message the operator may adjust (reduce) the allocated retention time defined on the RPG Product Generation Table Editor window. This would free space for additional products written to disk.

3.3.5 RDA Radial Load Shed.

The RDA Radial Load Shed category corresponds to the data buffer used to receive raw messages from the RDA. The numbers represent the percentage of unread messages to the total number of messages allowed in the buffer. This buffer is input to the Process Base Data task. If the task cannot process the messages fast enough (the percentage of unread messages reaches the alarm threshold) the RDA Radial Load Shed alarm in the RPG Status window will be set (red). The RPG container in the RPG Control/Status window will be red to indicate an RPG alarm is active. If the Process Base Data task tries to read a message that no longer exists a volume scan restart will be issued.

This category is combined internally with the RPG Radial Load Shed category to an Input Buffer load shed category to support the single Input Buffer alarm in the general status message sent to narrow-band users. An alarm condition in either of these categories will activate the Input Buffer alarm in the general status message. The use of two input categories better isolates data flow or buffer size problems.

3.3.6 RPG Radial Load Shed.

The RPG Radial Load Shed category corresponds to the base data input buffer to the Velocity Dealiasing task (data output from the Process Base Data task). The numbers represent the percentage of unread messages to the total number of messages allowed in the buffer. If the task cannot process the messages fast enough (the percentage of unread messages reaches the alarm threshold) the RPG Radial Load Shed alarm in the RPG Status window will be set (red). The RPG container in the RPG Control/Status window will be red to indicate an RPG alarm is active.

This category is combined internally with the RDA Radial Load Shed category to an Input Buffer load shed category to support the single Input Buffer alarm in the general status message sent to narrowband users. An alarm condition in either of these categories will activate the Input Buffer alarm in the general status message. The use of two input categories better isolates data flow or buffer size problems.

SECTION 3.4. ADAPTATION DATA

3.4.1 Adaptation Data.

Click on the RPG Products button, and the RPG Products window opens. There are five categories under the Adaptation Data block:

- Alert/Threshold
- Generation List
- Load Shed Products
- Selectable Parameters
- Algorithms.

These are the parameters that are modifiable at the HCI to adapt the RPG for use at a particular site or for alternative missions and modes of operations. Each is discussed individually below.

3.4.1.1 Alert/Threshold. The Alert Threshold Editor window lists all categories for which alert thresholds may be assigned. The alert categories are Grid Group, Volume Group, and Forecast Group. Listed for each category are the Units, Minimum and Maximum values, the six Thresholds, and the Paired Product. The user can alter any one of the values to be alerted on, but the number of thresholds or categories cannot be altered. Changes to alert thresholds through the edit window must be made only with proper authorization.

For the product Alert Pairing, the user can define the product to be paired with any alert (grid, volume, or forecast categories) phenomenon. That product paired with each alert on this window is the product that will be generated and sent to the Associated User (if requested) when that threshold is met or exceeded. Only one product may be paired with any single alert.

3.4.1.2 Generation List. The RPG Product Generation Table Editor window lists all the categories that can be modified by the user. There are four basic tables that the user can select: Current, Precipitation (A), Clear Air (B), and Maintenance. The RPG Product Generation, Storage, storage time in minutes, and the number of elevation cuts are identified for each of the four tables. All products that may be generated routinely are listed. These lists are generated separately from the Associated User routine product set lists. The current list is volatile because whenever the mode changes, this list will disappear and be replaced with the list associated with the adaptation control data generated.

The Generation Table Editor is displayed for editing and selecting products with specific parameters for routine generation. Mode changes will cause this list to be replaced with the one generated. This editor is used to define the default product generation and distribution list for Precipitation Mode A and Clear Air Mode B. This list satisfies the product requirements for other users, including non-associated users.

The lists A or B may be downloaded to the RPG with the Download button, or it is automatically downloaded if the operational mode changes from B to A as a result of the precipitation detection algorithms detecting precipitation.

The Current Generation window is used to make online changes to the currently executing list. When changes are made and saved, the list is downloaded automatically for use on the next volume scan.

3.4.1.3 Load Shed Products. The RPG Product Priority (Load Shed Products) window provides the user the capability to specify the load shed priority for the three modes: Precipitation (A), Clear Air (B), and Maintenance (M).

The load shedding of products is task-based. The highest priority assigned to any product in the task becomes the task priority. Load shed parameters for base products are set on the basis of “product type”. For example, one priority is set for all products of Base reflectivity, 8 level, 0.54 nm, for all elevations. Load shedding priorities are not specified to individual elevation angles. Volume scan products are specified for load shedding as individual products. Examples of load shedding are discussed in detail in [Section 3.3. LOAD SHEDDING](#).

3.4.1.4 Selectable Parameters. The Edit Selectable Product Parameters window provides the user the capability to edit the selectable parameters on eight products/windows. These are:

- Cell Product
- Layer Product
- OHP/THP Data Levels
- RCM Product
- RCM Reflectivity Data Levels
- STP Data Levels
- VAD and RCM Heights
- Velocity Data Levels

These selections are password protected for making any changes. These selections may be viewed by clicking on the title or the button to the left of each title. However, in order to change any parameters, the current password for the level of change authority desired must be entered for the parameter values to become sensitized and changeable. See paragraphs [2.3.13.2.1.4](#) and [3.7.1](#) for additional information

For the Cell, parameters listed, the user can change the Current parameters as the Minimum and Maximum values and the respective units are fixed values within the table.

For the OHP/ THP, and STP Data Levels, the data levels can be changed.

For the VAD and RCM Heights, the selectable height levels are designated for each 1,000 ft above site elevation and the desired heights can be selected. There are a maximum of 30 heights that can be selected for the VAD and 19 heights that can be selected for the RCM. The RCM must have a corresponding VAD height.

For the Velocity Data Levels, there are eight Velocity tables to select from, and the range in kts can be entered for each respective table.

For the RCM Product, Layer Product, and RCM Reflectivity Data Levels, none of the parameters are URC LOCA.

3.4.1.5 Algorithms. Meteorological algorithm parameters are allowed to be adjusted in various sub-windows when the Algorithms window is selected. The pull down window of the adaptation item is in alphabetical order and lists only the editable algorithms (i.e., have URC LOCA for one or more values):

- Combined Shear
- Hail Detection
- Hydromet Adjustment
- Hydromet Preprocessing
- Hydromet Rate
- MDA
- Mesocyclone
- Snow Accumulation
- Storm Cell Components
- Storm Cell Tracking
- Tornado Detection
- VAD
- Velocity Dealiasing_Multi PRF

These selections are password protected. These algorithm parameters may be viewed by clicking on the title or the button to the left of each title. However, in order to make changes, the current password for the URC LOCA must be entered to sensitize the values and make them changeable.

For each of the adaptation items, the name of the variable and the Range allowed (and units if applicable) is listed. The user selects the value desired for each item. Specific details on how to work with the Algorithm window is found in paragraph [2.3.13.2.1.5](#).

SECTION 3.5. VOLUME COVERAGE PATTERN

3.5.1 VCP Control Window.

The VCP Control window allows different volume coverage patterns to be downloaded to, or changed at, the RDA for use in the next volume scan. In addition, dialogs are provided for modifying existing VCP data. See Figure 3-2.

The screenshot shows a window titled "VCP Control" with a "Close" button. Below the title bar, there is a section for "Auto PRF:" with a green indicator light and the text "On", and an "Off" option. The main content area is divided into two sections: "CHANGE to RDA VCP" and "DOWNLOAD VCP from RPG".

CHANGE to RDA VCP

Precipitation:	11	21
Clear Air:	31	32
Maintenance:	300	

DOWNLOAD VCP from RPG

Precipitation:	11	12	21	121
Clear Air:	31	32		
Maintenance:	300			

At the bottom, there are two rows of buttons. The first row has "Modify VCP:" followed by "Current" and "Adaptation". The second row has "Restart:" followed by "VCP" and "Elevation".

Figure 3-2. VCP Control

3.5.1.1 Auto PRF On/Off. The top line of the VCP Control window enables the user to turn the Auto PRF on or off. See paragraph 2.3.6.1.2 for additional information.

3.5.1.2 CHANGE to RDA VCP. To request a new volume coverage pattern using VCP data defined at the RDA, click on the appropriate VCP button. If the request is successful, the new volume coverage pattern will begin with the next volume scan.

3.5.1.3 DOWNLOAD VCP from RPG. To request a new volume coverage pattern defined at the RPG to be downloaded to the RDA, click on the appropriate VCP button. If the request is successful, the new volume coverage pattern will begin with the next volume scan.

3.5.1.4 Modify VCP. The Modify VCP selections allow the user to modify the attributes of the currently active VCP or any one of the adaptation VCPs. Once data for a VCP is modified, it can be saved and downloaded to the RDA.

3.5.1.4.1 Modify VCP - Current. When the Current button is selected, another window opens that is called the PRF Selection (Modify Current VCP) window ([Figure 3-3](#)). There are selections to change the Velocity Increments, to modify elevations, an Area Obscuration tabular listing of the three Sectors for each PRF, and a window that visualizes and easily modifies the sector definitions.

The top line contains five control buttons (Close, Save, Undo, Download, and Refresh) plus the Velocity Increment selection choices. The first button in the upper left hand corner is the Close button. Clicking on the Close button without making any changes closes the screen and returns the user to the VCP Control window.

The Save button is grayed-out and desensitized until changes are made on the screen. Then it becomes active and when clicked on, brings up a warning_popup that states: “You are about to overwrite the current VCP data with your edits. Do you want to continue?” Click on either the Yes or No button to select the desired response. Selecting Yes returns the user to the PRF Selection (Modify Current VCP) screen and desensitizes the Save button; selecting No also returns the user to the PRF Selection (Modify Current VCP) window but leaves the Save button active.

The Undo button is grayed-out and desensitized until changes are made on the window. Then it becomes active. After making any changes in the window and the user does not want to save any of the changes, then click on the Undo button and all edits are deleted.

The Download button will allow the user to transfer all the changes made on the existing window to the current VCP at the RDA (assuming that the auto PRF function is disabled.) When the Download button is clicked, a warning_popup opens that states: “You are about to download the current VCP changes to the RDA. Do you want to continue?” Click on either the Yes or No button to select the desired response. If the Auto PRF function is enabled, then the user cannot make any changes to the current VCP. To keep from having to go back to the VCP Control screen, a second warning_popup opens (if the user selected Yes to the previous Download option) that states “The Auto PRF function is currently enabled. If you do not disable it, your changes may be lost at the next volume scan. Do you want to disable the Auto PRF function?” Click on either the Yes or No button to select the desired response. Selecting Yes will turn the Auto PRF to Off and return the user to the PRF Selection screen.

The Refresh button allows the user to update the base reflectivity and obscuration data while editing the field. When the window is initially pulled up, the latest base reflectivity and obscuration data is obtained from the latest products available in the data base. The date/time is shown over the top of the color bar scale. While the window is being edited, the background data stays the same, even if new products become available. If the user wants to see the latest data available, then click on the Refresh button. There is no warning_popup window that opens. The latest data will appear on the edit screen, and the date/time will update with the product date/time.

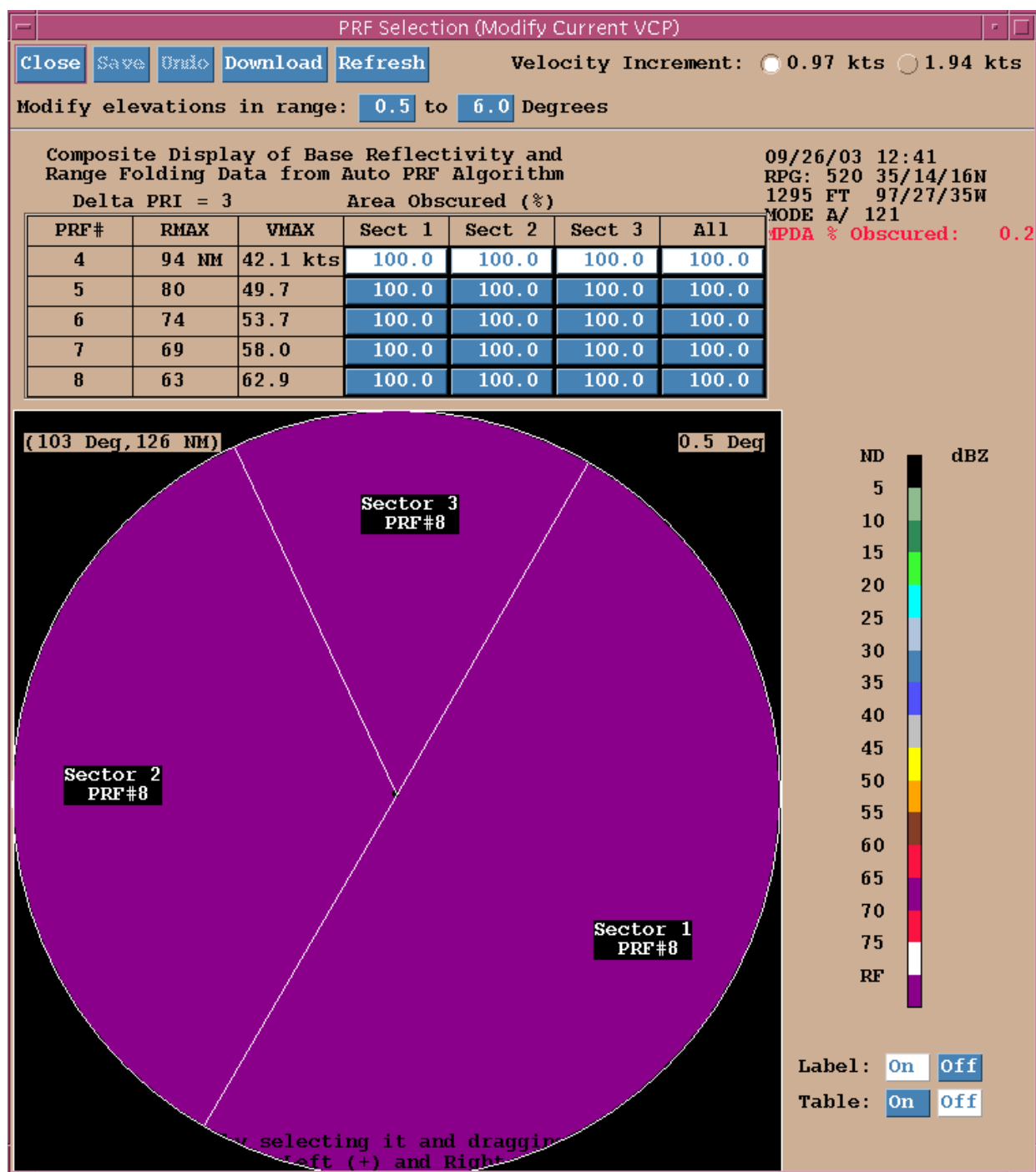


Figure 3-3. PRF Selection (Modify Current VCP)

3.5.1.4.1.1 Velocity Increment. The Velocity Increment of 0.97 kts (0.5 m/s) or 1.94 kts (1 m/s) can be selected by clicking on the appropriate button.

3.5.1.4.1.2 Modify Elevations Range. These buttons define a range of elevations for applying PRF# and sector boundary changes. When a PRF# or sector boundary is changed, the new PRF# or sector boundary will be applied to all elevations in the range shown. Both the minimum and maximum elevation ranges can be modified by selecting the appropriate button. If changing the minimum range would cause the minimum range to be greater than the maximum range, the maximum range will be increased automatically to match the minimum range. When the highest elevation angle is reached, selecting either button will cause the elevation range to start all over again at the lowest elevation angle for this VCP.

3.5.1.4.1.3 Area Obscuration Table. This table contains a set of buttons whose labels represent the percentage of area obscured in a given sector for each allowable PRF#. When a button is selected, obscuration data for the appropriate sector is updated in the display region. If new sector boundaries are defined, the labels for the buttons are updated reflecting the new percentages of obscuration for those sectors.

The row of data that has a white background is a visual aid to the user that identifies the minimum PRF values for that screen. This field is not editable by the user, but is automatically produced each time the window is requested.

3.5.1.4.1.4 Composite Reflectivity and Obscuration Data Display Region. The Composite Reflectivity and Obscuration Data Display window provides a composite display of base reflectivity and obscuration data along with lines representing each of the three sector boundaries. When the cursor is close to a sector boundary line, it changes appearance from an arrow to a pointing hand. This indicates that the sector boundary line can be moved by pressing the left button while dragging the line. When the left button is released, the data in the display are updated. The relative position of the cursor (in azimuth and range) is always displayed in the upper left corner of the display region. As new sector boundaries are defined, data in the Area Obscuration table and PRF Sectors Data window are updated.

This window provides information about which regions will be obscured (range folded) in velocity and spectrum width products for a given PRF# by displaying the base reflectivity overlaid with obscuration data generated by the auto PRF algorithm. Since range folding will not occur in base reflectivity products, base reflectivity can be used to identify where meteorological targets are. The obscuration data will show areas where velocities and spectrum widths will be unresolvable for a given PRF#.

3.5.1.4.1.5 Modify Current VCP Data Table. By clicking on the “Table On” button in the lower right hand corner, the user can then modify the current VCP data. The Modify Current VCP Data table provides a textual presentation of data associated with the current VCP. See Figure 3-4. Items which are editable are displayed in light blue (Azimuth) and dark blue (PRF#). Items which are not editable are desensitized. The text entry items, sector azimuths and signal/noise ratios, can be modified using the keyboard. PRF# values can be changed by repeatedly selecting an item until the desired PRF# is displayed. Changes made in this window are not automatically displayed in the PRF Selection (Modify Current VCP) window. The Refresh button has to be clicked to display the changes. For additional information and detail, refer to Chapter 2, paragraph 2.3.6.1.5.1.

Modify Current VCP Data

Show: ☐ PRF# ☐ RMAX (NM) ☐ Velocity Increment: ☐ 0.97 kts ☐ 1.94 kts

Elevation		Scan Waveform		Sector 1		Sector 2		Sector 3		Signal/Noise Ratio (dB)		
#	Degrees	Seconds	Type	Azimuth	PRF #	Azimuth	PRF #	Azimuth	PRF #	Refl	Vel	Width
1	0.5	19	CS	0.0	1	0.0	1	0.0	1	2.00	2.00	2.00
2	0.5	19	CD/W	30.0	5	210.0	5	335.0	5	3.50	3.50	3.50
3	1.5	18	CS	0.0	1	0.0	1	0.0	1	2.00	2.00	2.00
4	1.5	19	CD/W	30.0	5	210.0	5	335.0	5	3.50	3.50	3.50
5	2.4	22	B	30.0	5	210.0	5	335.0	5	3.50	3.50	3.50
6	3.4	20	B	30.0	5	210.0	5	335.0	5	3.50	3.50	3.50
7	4.3	20	B	30.0	5	210.0	5	335.0	5	3.50	3.50	3.50
8	5.3	21	B	30.0	5	210.0	5	335.0	5	3.50	3.50	3.50
9	6.2	21	B	30.0	5	210.0	5	335.0	5	3.50	3.50	3.50
10	7.5	14	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50
11	8.7	14	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50
12	10.0	14	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50
13	12.0	14	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50
14	14.0	14	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50
15	16.7	14	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50
16	19.5	14	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50

Azimuth Range: (0 to 359.9)
SNR Range: (-12.0 to 20.0 dB)

Figure 3-4. Modify Current VCP Data

3.5.1.4.2 Modify VCP - Adaptation. When the Adaptation button is clicked, the Modify VCP Adaptation Data window opens. See [Figure 3-5. Modify VCP Adaptation Data](#). It is password protected so the proper password for the level desired must be successfully entered before any editing can be done. To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7 Password Window](#). The Close, Save, Undo, Baseline: Restore, and Baseline: Update buttons are explained in detail in Chapter 2, paragraph [2.3.6.1.5.2](#).

3.5.1.4.2.1 VCP Selection. There are seven buttons that identify the seven selections of VCP that can be made. By default, the adaptation data version of the currently active VCP is displayed.

3.5.1.4.2.2 Show: PRF# or RMAX. The user can toggle between the PRF# or the RMAX (Maximum Range in NM) and the table on the window is automatically refreshed.

3.5.1.4.2.3 Velocity Increment. The Velocity Increment can be changed to 0.97 kts (0.5 m/s)(High) or 1.94 kts (1 m/s) (Low) by clicking on the appropriate button.

The default value is 0.97 kts and has a resolution of 0.5 m/s. If any of the ambient winds are expected to exceed 124 kts, then use the Velocity Increment of 1.94 kts as that is the only way the radar can measure those higher wind speeds. Even though the resolution then becomes 1.0 m/s, the impact on accuracy would be minimal. This applies to not only surface winds but any level winds the radar may see. This may be most applicable at coastal sites that may be affected by tropical cyclones.

3.5.1.4.2.4 Adaptation Data Table. The Modify VCP Adaptation Data table provides a textual presentation of data associated with the selected VCP. Items which are editable are displayed a light blue background. Items which are not editable are displayed with a brown background and desensitized. The text entry items, sector azimuths and signal/noise ratios, can be modified using the keyboard. PRF# values can be changed by repeatedly selecting an item until the desired PRF# is displayed. Changes made in this window do not automatically get updated for the selected VCP until the Save button or Baseline Update buttons are clicked on.

3.5.1.5 Restart VCP. This button provides the user with the opportunity to restart the VCP. Click on the VCP button and a warning_popup opens that states: “You are about to stop the current data collection and start over at the lowest elevation cut. Do you want to continue?” Click on either the Yes or No button to select the desired response. It is recommended not to restart the VCP unless the antenna is below 5.3 degrees elevation.

3.5.1.6 Restart Elevation This button provides the user with the opportunity to restart the current elevation angle. Click on the Elevation button and a warning_popup opens that states: “You are about to stop the current data collection and start the elevation cut over. Do you want to continue?” Click on either the Yes or No button to select the desired response.

Modify VCP Adaptation Data

Close Save Undo Baseline: Restore Update

VCP Selection

☐ 11
 ☐ 12
 ☐ 21
 ☐ 31
 ☐ 32
 ☒ 121
 ☐ 300

Show: ☐ PRF# ☐ RMAX (NM) Velocity Increment: ☐ 0.97 kts ☐ 1.94 kts

Elevation		Scan		Waveform		Sector 1		Sector 2		Sector 3		Signal/Noise Ratio (dB)	
#	Degrees	Seconds	Type	Azimuth	PRF #	Azimuth	PRF #	Azimuth	PRF #	Refl	Vel	Width	
1	0.5	12	CS	0	8	0	8	0	8	2.00	2.00	2.00	
2	0.5	12	CD/W	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	
3	0.5	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	
4	0.5	17	CD/WO	30.0	4	210.0	4	335.0	4	3.50	3.50	3.50	
5	1.5	12	CS	0	8	0	8	0	8	2.00	2.00	2.00	
6	1.5	12	CD/W	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	
7	1.5	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	
8	1.5	17	CD/WO	30.0	4	210.0	4	335.0	4	3.50	3.50	3.50	
9	2.4	19	B	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	
10	2.4	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	
11	2.4	17	CD/WO	30.0	4	210.0	4	335.0	4	3.50	3.50	3.50	
12	3.3	17	B	30.0	8	210.0	8	335.0	8	3.50	3.50	3.50	
13	3.3	13	CD/WO	30.0	6	210.0	6	335.0	6	3.50	3.50	3.50	

Azimuth Range: (0 to 359.9 Deg) - SNR Range: (-12.0 to 20.0 dB)

Figure 3-5. Modify VCP Adaptation Data

3.5.2 PRF Selection Window.

Click on the PRF Selection icon under the Applications column and the PRF Selection (Modify Current VCP) window opens. See [Figure 3-6. PRF Selection \(Modify Current VCP\)](#). This is the most direct way to open this window. There are two other routes the operator may use to open this window.

NOTE

If the RDA-RPG link is not connected or if the RDA is in local control, this window will not open. A warning_popup appears that states: "PRF selection is not allowed while the RDA is in local control or the RDA-RPG link is not connected." Click on the OK button to continue.

The second route to the PRF Selection window is via the VCP Control window. Click on the VCP button that overlays the radials near the top of the HCI. Once in the VCP Control window, click on the Modify VCP Current button.

The third route is via the RDA Control window. Click on RDA Control, then on the VCP button, and the VCP Control window then opens. Once in the VCP Control window, click on the Modify VCP Current button.

The PRF Selection window has been previously described in sections [2.3.6.1.5](#), [2.3.6.1.5.1](#), and [3.5.1.4.1](#). Please refer to these sections for additional information.

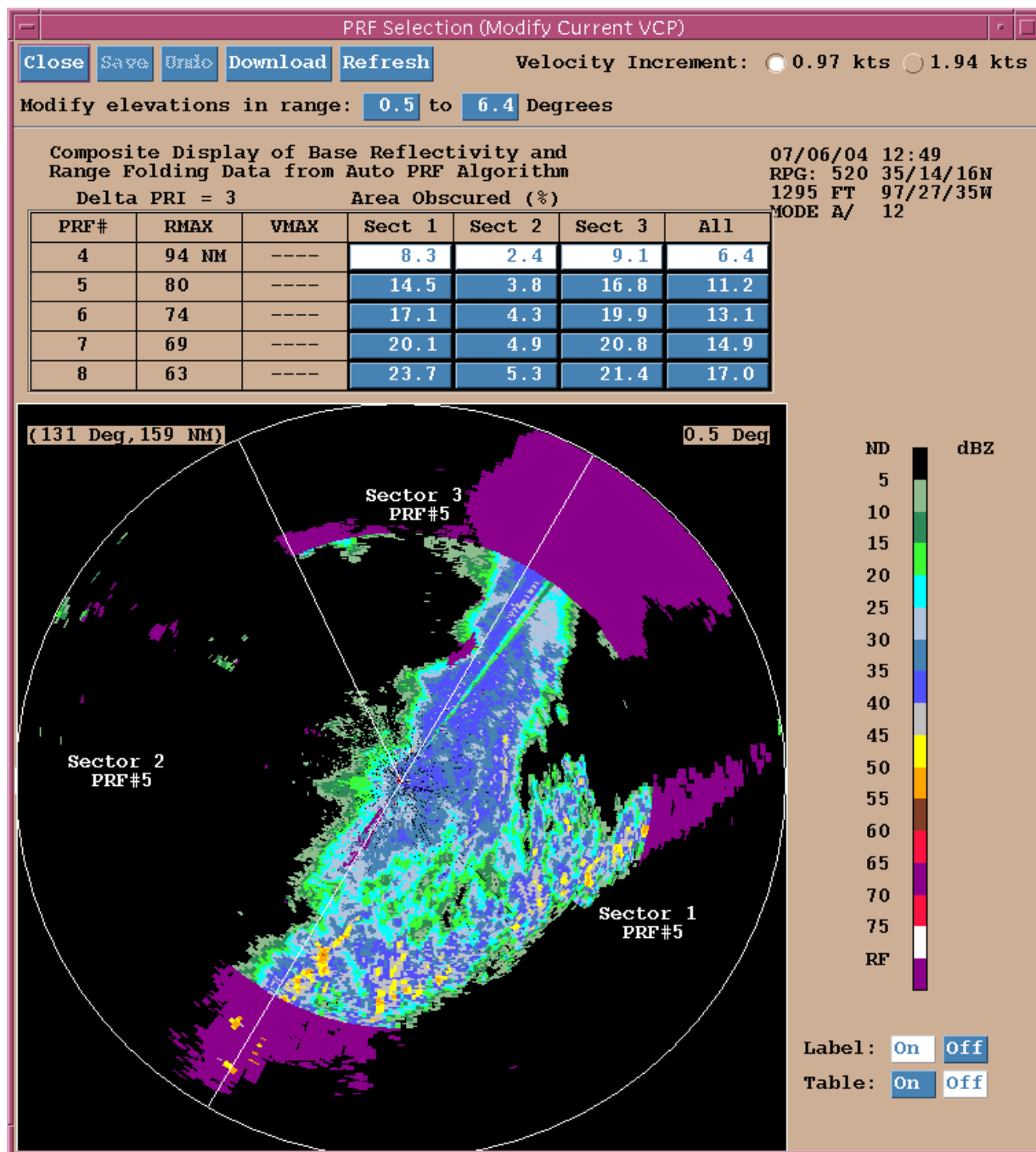


Figure 3-6. PRF Selection (Modify Current VCP)

SECTION 3.6. VOLUME COVERAGE PATTERN (VCP) CHANGES AND AUTOMATIC PRF SELECTION.

3.6.1 Introduction.

There are six operational scan strategies. They are: VCP 11 (fourteen elevation scans, five minutes), VCP 21 (nine elevation scans, six minutes), VCP 31 (five elevation scans, ten minutes, long pulse), VCP 32 (same as VCP 31 except short pulse), VCP 12 (fourteen elevation scans, 4.1 minutes), and VCP 121 (nine elevation scans, 4.9 minutes).

For each of these scan strategies, changes may be made to the PRF and sector definitions through the VCP Control window.

Temporary changes to a VCP may be accomplished through the VCP Control window by selecting the Modify VCP Current button and editing the PRF Selection (Modify Current VCP) window (it is not password protected). Manual PRF changes are generally required to minimize or change the range-folded data areas related to detected weather.

3.6.2 VCP Modification and PRF Selection.

VCP modification and PRF selection will be discussed separately below.

3.6.2.1 VCP Modification. VCPs should be modified through the VCP Control window's Modify Current VCP Data window. The VCP Control window's Modify VCP Adaptation Data window is editable via ROC LOCA only. The Modify Current VCP Data window allows the operator to modify the following quantities:

- Velocity Increment
- Beginning and ending azimuth for each azimuth sector
- Doppler PRF for each azimuth sector

Validity checks on the entered values for these quantities ensure that the Velocity Increment is either 0.97 knots or 1.94 knots, successive Edge Azimuth values (if selected) are monotonically increasing in a clockwise direction, and the Doppler range values entered are those that are applicable for the range of 4, 5, 6, 7, and 8. If the operator selection is invalid, an error message will be displayed. A valid selection results in an acknowledgement message.

Velocity Increment (VI) selections define the quantization of the available base velocity data. VIs are available for .97 kts (0.5 m/s) and 1.94 kts (1.0 m/s). The code for reporting velocity is an eight-bit word which will accommodate velocities from -124 kts to +124 kts. In order to accommodate wind speeds detected in excess of 124 kts, the VIs may be changed to 1.94 kts. The selection of a velocity increment also dictates which velocity threshold table will be used to quantize the velocity data for display.

To reduce range folding, the user can set the Doppler range of all azimuth sectors in each elevation cut below 7.0 degrees with a single entry. In this case, the PRF number used is that PRF value which provides the unambiguous range closest to the operator-selected range within the allowable limits. To aid the operator in selecting the unambiguous range, the current site-specific set of PRF numbers in use is displayed on the RDA control menu. When all modifications are completed, they are saved by either clicking on the Save button and selecting Yes, or clicking on the Close button and selecting Yes.

For the modified VCP to become active, the user must download the VCP to the RDA by clicking on Save then Yes on the Modify VCP Adaptation data window, then clicking on the desired VCP in the center of the VCP Control box under the category: "Download VCP from RPG".

3.6.2.2 Automatic PRF Selection. When Automatic PRF Selection is enabled by the user, the Auto PRF Selection Algorithm analyzes reflectivity data from the lowest elevation cut to determine the PRF number which results in the smallest range folded area for that cut. This PRF number is then inserted into all azimuth sectors of each elevation cut below seven degrees in the current volume coverage pattern. When the Auto PRF is clicked On, the Doppler PRF values in the current VCP will be modified automatically.

It is important to note that while auto PRF minimizes the range-folded data area, this may not remove range-folded data in the area of operator concern. In order to move range folded data in a specific area of interest, it may be necessary for the operator to make a manual PRF selection. The Auto PRF will minimize range-folded data but not totally eliminate it.

3.6.2.2.1 Auto PRF in the OFF Position. In this case, the PRFs defined in the active VCP are used. No changes other than those entered manually will be made.

3.6.2.2.2 Auto PRF in the ON Position. In this case, the PRF is automatically adjusted each volume scan based on the PRF selection algorithm.

SECTION 3.7. SELECTION OF PRODUCT PARAMETERS

3.7.1 Introduction.

These password protected Edit Selectable Product Parameters windows are used to adjust adaptation parameters controlling the appearance of products. Clicking on the RPG Products button, then clicking on the Selectable Parameters button pulls up the Edit Selectable Product Parameters windows.

The nine types of product parameters which can be adjusted are:

- Cell Product
- Layer Product
- OHP/THP Data Levels
- RCM Product
- RCM Reflectivity Data Levels
- STP Data Levels
- VAD and RCM Heights
- Velocity Data Levels

The standard controls for each window: Close, Save, Undo, Baseline: Restore, Baseline: Update, and Password Protection are fully described in Chapter 2. To open the password protected fields for edit, follow the procedures described in paragraph [2.2.4.1.7 Password Window](#). Specific instructions applicable to each window are also described in Chapter 2. The operational considerations for each of the windows are discussed below in detail.

3.7.2 Cell Product.

The Cell Product Parameters window (Figure 3-7) is used to adjust the following adaptation parameters:

- Maximum number of cells in STI Alphanumeric Product
- Maximum number of cells in SS Alphanumeric Product
- Maximum number of cells in HAIL Alphanumeric Product
- Maximum number of cells in STI Attribute Table
- Maximum number of cells in Combined Attribute Table
- Maximum number of cells in HAIL Attribute Table

Edit Selectable Product Parameters

☐ Cell Product
 ☐ Layer Product
 ☐ OHP/THP Data Levels

Category:
 ☐ RCM Product
 ☐ RCM Reflectivity Data Levels
 ☐ STP Data Levels

☐ VAD and RCM Heights
 ☐ Velocity Data Levels

Cell Product Parameters

Parameter Name	Minimum	Maximum	Current	Units
Max # Cells - STI Alphanumeric Product	7	100	34	storm cells
Max # Cells - SS Alphanumeric Product	10	100	40	storm cells
Max # Cells - Hail Alphanumeric Product	10	100	40	storm cells
Max # Cells - STI Attribute Table	6	100	36	storm cells
Max # Cells - Combined Attribute Table	4	100	32	storm cells
Max # Cells - Hail Attribute Table	6	100	36	storm cells

Figure 3-7. Cell Product Parameters

This menu is used to adjust the maximum number of storm cells in the STI (Storm Track Information), SS (Storm Structure), and Hail Alphanumeric products as well as the STI, Hail, and Combined Attribute tables. The primary reason for limiting the number of storm cells in products is to reduce the product sizes and, hence, reduce the chances of narrowband loadshedding. The parameters in this menu do NOT affect the number of storm cells identified and tracked or the number of storm cells in the STI and Hail graphic products or overlays.

3.7.2.1 How the Storm Cells are Limited. The storm cells are sorted by a 'severity' attribute. For example, in the STI product, the storm cells are sorted first by Cell-based VIL and secondly by maximum reflectivity. When the number of storm cells identified exceed the maximum number of storm cells in a particular portion of a product (example, within a 10 nm radius), the storm cells nearest the top of the sorted list (i.e. "The most severe" storm cells) are included. The storms at the bottom of the list (least severe) are removed from the visual window, thereby retaining the most severe storm cells.

3.7.2.2 Considerations. When changing these parameters, one must consider that all users of the product will be affected. A compromise between the number of 'useful' storm cells and narrowband loadshedding should be the goal.

In the range of values, the upper limit is 100 which is the same as the upper limit on the maximum number of storm cells per volume scan (see the CENTROIDS Algorithm Adaptable Parameters). The lower limit for each parameter is the number of storm cells which fit on the first page of that part of the product. For example, there can be up to 10 storm cells on the first page of the Hail Alphanumeric product. To reduce the product sizes most efficiently, decrease the maximum number of storm cells by the number of storm cells which fit on whole pages of a product. The number of storm cells which fit on each page is equal to the lower limit in the range of acceptable values, except for the STI Alphanumeric product. For example, the number of storm cells per page of the Hail Attribute Table is 6. For the STI Alphanumeric product, the first page lists up to 7 storm cells, but each additional page can list up to 9 storm cells.

3.7.3 Layer Product.

The Layer Product Parameters window (Figure 3-8) is used to adjust the following adaptation parameters for the Layer Products:

Close Save Undo Baseline: Restore Update

Category: ☐ Cell Product ☐ Layer Product ☐ OHP/THP Data Levels
☐ RCM Product ☐ RCM Reflectivity Data Levels ☐ STP Data Levels
☐ VAD and RCM Heights ☐ Velocity Data Levels

Layer Product Parameters

Parameter Name	Minimum	Maximum	Current	Units
Layer 0 Height	0	52	2	kft
Layer 1 Height	6	58	24	kft
Layer 2 Height	12	64	33	kft
Layer 3 Height	18	70	60	kft
Range Limit	40	460	230	km

Figure 3-8. Layer Product Parameters

3.7.3.1 Layer 0 Height (KFt. MSL). This parameter defines the height of the bottom of the first layer in thousands of feet above mean sea level for Layer Composite Reflectivity products.

3.7.3.2 Layer 1 Height (KFt. MSL). This parameter defines the height of the top of the first layer and the bottom of the second layer in thousands of feet above mean sea level for Layer Composite Reflectivity products.

3.7.3.3 Layer 2 Height (KFt. MSL). This parameter defines the height of the top of the second layer and the bottom of the third layer in thousands of feet above mean sea level for Layer Composite Reflectivity products.

3.7.3.4 Layer 3 Height (KFt. MSL). This parameter defines the height of the top of the third layer in thousands of feet above mean sea level for Layer Composite Reflectivity products.

3.7.3.5 Range Limit. This parameter defines the range of coverage in kilometers for Layer Composite Reflectivity products.

NOTE

The top height of layer 1 is the bottom height of layer 2. The top height of layer 2 is the bottom height of layer 3. These parameters affect both the average and maximum Layer Composite Reflectivity products. These parameters are no longer under URC LOCA as they were in the past.

3.7.4 OHP/THP Data Levels.

The OHP/THP Data Levels window (Figure 3-9) is used to adjust certain precipitation accumulation Data Levels displayed for the One Hour Precipitation (OHP) and Three Hour Precipitation (THP) products. The adjustable levels are associated with fixed color codes 3 to 16 and fixed levels with color codes 1 and 2.

Edit Selectable Product Parameters																																							
<div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> Close Save Undo </div> <div style="display: flex; justify-content: space-between;"> Baseline: Restore Update </div>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <input type="radio"/> Cell Product Category: </div> <div style="text-align: center;"> <input type="radio"/> Layer Product RCM Product </div> <div style="text-align: center;"> <input type="radio"/> OHP/THP Data Levels STP Data Levels </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <input type="radio"/> VAD and RCM Heights </div> <div style="text-align: center;"> <input type="radio"/> Velocity Data Levels </div> </div>																																						
<p>-----INSTRUCTIONS----- Permissible value range is from 0.0 to 12.7 inches in multiples of 0.05. The value entered represents the minimum value of the data level.</p>																																							
OHP/THP Data Levels																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">Code</th> <th style="width: 45%;">Current (inches)</th> </tr> </thead> <tbody> <tr><td>1</td><td>ND</td></tr> <tr><td>2</td><td>></td></tr> <tr><td>3</td><td>></td></tr> <tr><td>4</td><td>></td></tr> <tr><td>5</td><td>></td></tr> <tr><td>6</td><td>></td></tr> <tr><td>7</td><td>></td></tr> <tr><td>8</td><td>></td></tr> </tbody> </table>	Code	Current (inches)	1	ND	2	>	3	>	4	>	5	>	6	>	7	>	8	>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">Code</th> <th style="width: 45%;">Current (inches)</th> </tr> </thead> <tbody> <tr><td>9</td><td>></td></tr> <tr><td>10</td><td>></td></tr> <tr><td>11</td><td>></td></tr> <tr><td>12</td><td>></td></tr> <tr><td>13</td><td>></td></tr> <tr><td>14</td><td>></td></tr> <tr><td>15</td><td>></td></tr> <tr><td>16</td><td>></td></tr> </tbody> </table>			Code	Current (inches)	9	>	10	>	11	>	12	>	13	>	14	>	15	>	16	>
Code	Current (inches)																																						
1	ND																																						
2	>																																						
3	>																																						
4	>																																						
5	>																																						
6	>																																						
7	>																																						
8	>																																						
Code	Current (inches)																																						
9	>																																						
10	>																																						
11	>																																						
12	>																																						
13	>																																						
14	>																																						
15	>																																						
16	>																																						

Figure 3-9. OHP/THP Data Levels Product Parameters

3.7.4.1 First and Second Levels. The first level is non-modifiable and is shown as the non-modifiable characters "ND", standing for "No Data". This denotes that color code 1 will be displayed for regions that have no accumulation and for the region outside the circular area of product coverage.

The second level cannot be edited and has the value of 0.00 inches denoting that color code 2 will be displayed for regions that have accumulations greater than zero inches but less than the level for code 3.

3.7.4.2 Third through Sixteenth Levels. The remaining levels 3 to 16 are modifiable and range from 0.05 through 12.70 in increments of multiples of 0.05. If any value is entered that is not evenly divisible by 0.05, the number will be automatically rounded up or down to the closest 0.05 value. One level cannot equal the level above or below it; there must be at least a 0.05 difference in value. Additionally, no number outside of 0.00 to 12.70 is accepted. If any number is entered that violates these rules, there are two different warning_popup windows that will appear. For numbers (XX.XX) that are outside the 0.00 to 12.70, the warning_popup states: "XX.XX is not valid, numeric value must be between 0.00 and 12.70." For any other incorrect entry (XX.XX) yet inside the range of 0.00 to 12.70, the warning_popup states, "XX.XX is not valid for table element AA, it must be greater than BB and less than CC." AA is the desired data table element, BB is the data table element below AA, and CC is the data table element above AA.

For code 3, accumulations greater than or equal to the level at code 3, and less than the level at code 4, will have color code 3. For code 16, any accumulations greater than or equal to the level at code 16 will be displayed with color code 16. If the accumulation exceeds the current value for Code 16, then the value of Code 16 should be periodically increased until the maximum range of 12.7 inches is entered. Consider increasing the codes below Code 16 to still present a proportional representation of the ongoing precipitation.

3.7.5 RCM Product.

The RCM Product window (Figure 3-10) is used to adjust the following parameters:

Baseline:

☐ Cell Product
 ☐ Layer Product
 ☐ OHP/THP Data Levels

Category:
 ☒ RCM Product
 ☐ RCM Reflectivity Data Levels
 ☐ STP Data Levels

☐ VAD and RCM Heights
 ☐ Velocity Data Levels

RCM Product Parameters				
Parameter Name	Minimum	Maximum	Current	Units
Range Threshold	-33.0	94.0	20.0	dBZ
Centroid Count	0	20	12	I

Figure 3-10. RCM Product Parameters

3.7.5.1 Range Threshold. This parameter is the reflectivity level, in dBZ, that defines the two color codes for RCM data outside 124 nm. This parameter is defined as the low end of the second color level.

3.7.5.2 Centroid Count. This is the maximum number of Centroids that will be identified in the RCM product. The allowable range is from 0 to 20, with a default of 12.

3.7.5.3 Restrict Class IV. This parameter, when selected, restricts the distribution of unedited RCMs to Class IV users from the RPG. This does not prevent an associated user from distributing it unless independently restricted by the user. Class IV users are Other Users.

3.7.5.4 Selection of Generation Time 1 and 2. These two parameters, when selected, will make the RPG generate and send the unedited RCM to the designated user at that specific time. The two times are independent of each other.

3.7.6 RCM Reflectivity Data Levels.

The RCM Reflectivity Data Levels window (Figure 3-11) is used to adjust the data level codes for displaying the specific reflectivity intensity cutoff value for each grid box of the RCM intermediate graphic product.

Edit Selectable Product Parameters

Baseline:

Category:

☐ Cell Product

☒ RCM Product

☐ VAD and RCM Heights

☐ Layer Product

☒ RCM Reflectivity Data Levels

☐ Velocity Data Levels

☐ OHP/THP Data Levels

☐ STP Data Levels

RCM Reflectivity Data Levels

-----INSTRUCTIONS-----
 Reflectivity data levels are in the range -33.0 to 95.0 dBZ. Data codes represent the lower (inclusive) cutoff value.

Code	Current (dBZ)
1	ND
2	15
3	30
4	40
5	45
6	50
7	55

Figure 3-11. RCM Reflectivity Data Levels Product Parameters

3.7.7 STP Data Levels.

The STP Data Levels window (Figure 3-12) is used to adjust certain precipitation accumulation data levels displayed for Storm Total Precipitation (STP) products. The adjustable levels are associated with fixed color codes 3 to 16, and fixed levels with color codes 1 and 2.

-----INSTRUCTIONS-----
Permissible value range is from 0.0 to 25.4 inches in multiples of 0.1. The value entered represents the minimum value of the data level.

Category: ☐ Cell Product ☐ RCM Product ☐ VAD and RCM Heights

Baseline: ☐ Layer Product ☐ RCM Reflectivity Data Levels ☐ Velocity Data Levels ☐ OHP/THP Data Levels ☒ STP Data Levels

Close Save Undo Restore Update

STP Data Levels

Code	Current (inches)
1	ND
2	0.0
3	0.3
4	0.6
5	1.0
6	1.5
7	2.0
8	2.5
9	>= 3.0
10	>= 4.0
11	>= 5.0
12	>= 6.0
13	>= 8.0
14	>= 10.0
15	>= 12.0
16	>= 15.0

Figure 3-12. STP Data Levels

3.7.7.1 First and Second Levels. The first level is non-modifiable and is shown as the non-modifiable characters “ND,” standing for “No Data” and denoting that color code 1 will be displayed for regions that have no accumulation, and also for the region outside the circular area of product coverage. The second level is non-modifiable and has the value of 0.00 denoting that color code 2 will be displayed for regions that have accumulations greater than zero but less than the level for code 3.

3.7.7.2 Third Through Sixteenth Levels. The remaining levels 3 through 16 are modifiable and range from 0.0 to 25.4 in increments of multiples of 0.1. If the user puts in a value outside this range, a warning_popup opens that states: “XX.X is out of range, it must be in the range $0.0 \leq A \leq 25.4$ ” where XX.X is the value entered and A is the allowable value. Click on the Continue button and the user is returned to the STP Data Levels window. If the user puts in a value inside the overall range, but not within the range for a specific table element, a warning_popup opens that states: “XX.X is not valid for table element TE, it must be greater than BB.B and less than CC.C” where XX.X is the value entered, TE is the table element the value was entered for, BB.B is the lower table element value, and CC.C is the upper table element value. Click on the Continue button and the user is returned to the STP Data Levels window.

3.7.8 VAD and RCM Heights.

The VAD and RCM Heights window (Figure 3-13) is used to determine which heights will be used by VWP and/or RCM when they are generated. The units of the heights selected are thousands of feet above mean sea level. Up to 30 VWP heights may be selected of which up to 19 may be both RCM and VWP.

Edit Selectable Product Parameters											
Close		Save	Print	Baseline:		Restore	Update				
<input type="radio"/> Cell Product <input type="radio"/> Layer Product <input type="radio"/> OHP/TRP Data Levels <input type="radio"/> RCM Product <input type="radio"/> RCM Reflectivity Data Levels <input type="radio"/> STP Data Levels <input checked="" type="radio"/> VAD and RCM Heights <input type="radio"/> Velocity Data Levels											
VAD and RCM Height Selections											
Level	VAD	RCM	Level	VAD	RCM	Level	VAD	RCM	Level	VAD	RCM
1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21	<input checked="" type="checkbox"/>	<input type="checkbox"/>	31	<input type="checkbox"/>	<input type="checkbox"/>	41	<input type="checkbox"/>	<input type="checkbox"/>
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22	<input checked="" type="checkbox"/>	<input type="checkbox"/>	32	<input type="checkbox"/>	<input type="checkbox"/>	42	<input type="checkbox"/>	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	33	<input type="checkbox"/>	<input type="checkbox"/>	43	<input type="checkbox"/>	<input type="checkbox"/>
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	<input type="checkbox"/>	34	<input type="checkbox"/>	<input type="checkbox"/>	44	<input type="checkbox"/>	<input type="checkbox"/>
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	35	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	45	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	36	<input type="checkbox"/>	<input type="checkbox"/>	46	<input type="checkbox"/>	<input type="checkbox"/>
7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	27	<input checked="" type="checkbox"/>	<input type="checkbox"/>	37	<input type="checkbox"/>	<input type="checkbox"/>	47	<input type="checkbox"/>	<input type="checkbox"/>
8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	28	<input checked="" type="checkbox"/>	<input type="checkbox"/>	38	<input type="checkbox"/>	<input type="checkbox"/>	48	<input type="checkbox"/>	<input type="checkbox"/>
9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	29	<input checked="" type="checkbox"/>	<input type="checkbox"/>	39	<input type="checkbox"/>	<input type="checkbox"/>	49	<input type="checkbox"/>	<input type="checkbox"/>
10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	30	<input checked="" type="checkbox"/>	<input type="checkbox"/>	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Height levels are represented in kft.											
NOTE: Up to 30 VAD height levels may be selected. Up to 19 RCM height levels may be chosen. An RCM level must be paired with a VAD height level.											

Figure 3-13. VAD and RCM Heights Product Parameters

3.7.9 Velocity Data Levels.

The Velocity Data Levels window (Figure 3-14) is used to adjust the ranges of velocity data levels displayed. Velocity increment units are expressed in knots.

Edit Selectable Product Parameters

Close Save Undo Baseline: Restore Update

Category: ☐ Cell Product ☐ Layer Product ☐ OHP/THP Data Levels
☐ RCM Product ☐ RCM Reflectivity Data Levels ☐ STP Data Levels
☒ VAD and RCM Heights ☒ Velocity Data Levels

Select Velocity Table

☒ (Precip 16/0.97) ☐ (Clear Air 16/0.97)
☐ (Precip 16/1.94) ☐ (Clear Air 16/1.94)
☐ (Precip 8/0.97) ☐ (Clear Air 8/0.97)
☐ (Precip 8/1.94) ☐ (Clear Air 8/1.94)

-----INSTRUCTIONS-----
 Select a table from the above list. Edits to the + side are reflected in the - side. The allowable value range is from 2 to 122 kts

Velocity Data Levels

Code	Current (knots)
1	ND
2	-64
3	-50
4	-36
5	-26
6	-20
7	-10
8	-1

Code	Current (knots)
9	0
10	10
11	20
12	26
13	36
14	50
15	64
16	Rr

Figure 3-14. Velocity Data Levels Product Parameters

3.7.9.1 First through Ninth Levels. These represent the negative (incoming) velocities and are not editable by the user. Level one is non-modifiable and is shown as the non-modifiable characters “ND”, standing for “No Data” and denoting that color code 1 will be displayed for regions that have no velocity value. Levels two through seven are non-modifiable by the user, but change to the corresponding negative velocities when positive values are entered correctly in the levels 10 through 15. Levels eight and nine are fixed values and are not editable by the user.

3.7.9.2 Tenth through Fifteenth Levels. The first level is non-modifiable and is shown as the non-modifiable characters "ND", standing for "No Data". This denotes that color code 1 will be displayed for regions that have no accumulation and for the region outside the circular area of product coverage.

3.7.9.3 Sixteenth Level. The sixteenth level is not editable, but represents that value that cannot be determined, and is classified as Range Folding (RF).

3.7.10 Gage Bias Adjustment Toggle.

A radar/rain-gage bias is computed by the AWIPS and sent to the RPG. The RPG precipitation products will optionally apply the bias to the rainfall accumulation products to provide a more accurate depiction of rainfall quantities. The adjustment corrects for systematic biases between measurements of rainfall via rain-gage and via radar.

Click on RPG Products, then click on Algorithms, then scroll down the list of Algorithms to the Hydromet Adjustment Algorithm. Click on the Hydromet Adjustment Algorithm. The default setting for the Bias Flag is False, which means the bias is not being applied. Open the password window at the URC level and the setting can then be changed. A pull down menu appears with either False or True as the available selection. Click on the desired selection and that becomes the new value and the pull down menu disappears. The Save button in the upper left of the window must now be clicked in order to save the new value for the Bias Flag. If the selection True is clicked and saved, then the bias will start being applied at the next volume scan.

SECTION 3.8. CLUTTER REGIONS

3.8.1 Introduction.

The Clutter Regions bypass map has two segments: Low for elevations at and below 1.65 degrees, and High for elevations above 1.65 degrees. Each sector contains clutter filter bypass control data required to configure the SPS clutter filters for a specific elevation and azimuth region. The clutter filtering is performed for specified regions. However, the bypass map remains in control for all unspecified areas. The Radar Data Acquisition System Operability Test (RDASOT) function, Generate Clutter Map, is used to build the bypass map automatically.

Editing of the clutter suppression regions are allowed from the Clutter Regions window. This is used to define both the degree of clutter suppression to be applied by the bypass filter and as an override to clutter suppression instructions dictated by the bypass filter. Up to fifteen individual clutter suppression regions may be defined in one file in terms of azimuth start/stop (0 to 360 degrees) and range start/stop (0 to 11 km). Up to 19 files (of 15 regions each) can be created at each site and stored in the RPG. When one of the files is downloaded to the RDA, it overwrites the file that had been previously downloaded. The Clutter Regions window is obtained by moving the cursor under the right hand side column called Applications and clicking on the square Clutter Regions icon. See Figure 3-15.

For FAA Redundant configurations, the user can edit the clutter regions only on the RPG channel that is active. If the user tries to edit the regions on the non-active channel, access is not even allowed to the window. When clicking on the padlock to open the editable fields, a warning_popup opens that states: “You cannot edit this data because the other RPG channel is Active.” Click on the Continue button and the user is returned to the Clutter Regions window.

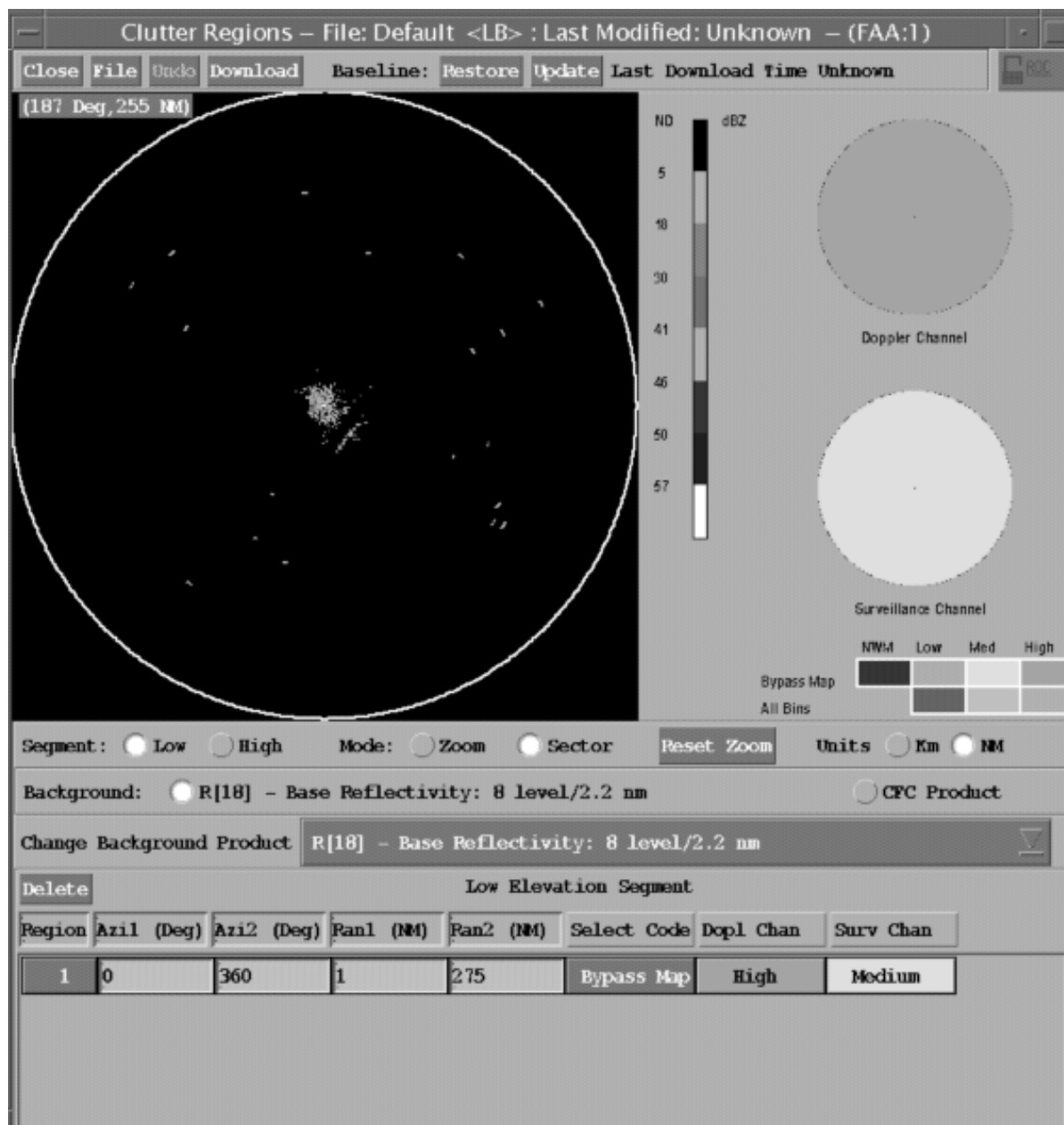


Figure 3-15. Clutter Regions

3.8.2 Clutter Regions Window Title.

The title line contains not only the title “Clutter Regions” but also two sources of information. The word File: identifies the file name of the current clutter region. (The listing of regions can be found by clicking on the File button, second line.) The second category called Last Modified: identifies

the date that the active clutter region was last changed. It will either have a date/time or the word Unknown if no file is available.

3.8.3 First Line of Commands.

The first button to the far left is the Close button. If no changes have been made, clicking on the Close button will close the window and return the user to the HCI.

If changes have been made and the Close button is clicked (without any other buttons being selected), a warning_popup opens that states: “You did not save your edits. Do you want to save them?” Click on Yes or No and the desired response will be taken. If No, the user is returned to the HCI. If Yes, then a separate Clutter Region Filename window opens, allowing the user to type in the label desired for the changes. Click in the box to get the blinking cursor in position to type in the new label. Once entered, click on Accept and the file is stored. If the user initially clicks on Close instead, the edits are not saved and the user returned to the HCI. If the Accept and then Close buttons are clicked in that order, the edits are saved before the user is returned to the HCI.

To open the password protected fields for edit, follow the procedures described in Paragraph 2-2.4.1.7. Padlock Window.

The rest of the commands are discussed as separate paragraphs below.

3.8.3.1 File Button and Files Window. The second button from the left is the File button. Clicking on the File button brings up the Clutter Region Files window. See [Figure 3-16](#).

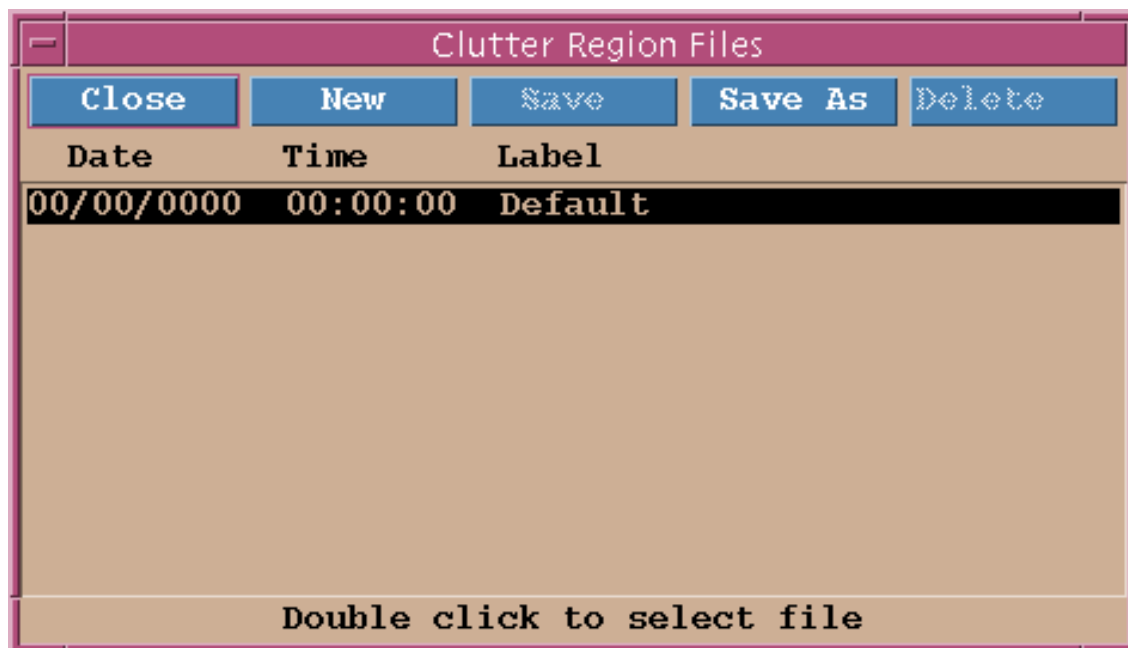


Figure 3-16. Clutter Region Files

This window has five commands plus a table of all the Clutter Region Files that are available to the user. The five commands are: Close, New, Save, Save As, and Delete. When this Clutter Region Files window is opened and no password has been entered in the original Clutter Regions window, by default, the following commands are sensitized and operational: Close, New, and Save As.

These three buttons allow the user to make a new clutter region file and select it for use without needing the site password. The user can also select an existing file, make changes to it, but then has to save it as a new file (i.e. the user cannot make a change to an existing file and then save it under the same name). The user cannot save any new files to the baseline, nor can the user delete any current clutter files.

Clicking on the Close button simply closes the Clutter Region Files window.

Clicking on the New button returns the user to the edit window and allows a new clutter region file to be developed. This action first copies the default file as a template. Then the user can edit the screen. This has no impact on any other file.

To save the changes as a separate file, click on the Save As button and another window opens titled: "Clutter Region Filename". See [Figure 3-17](#).



Figure 3-17. Clutter Region Filename

Click on the light box to the right of the title Label: and type in the desired filename. Then click on the Accept button to accept the filename, or click on the Cancel button to cancel the action and delete the file. If the filename is accepted, the Clutter Region Files window will refresh and the new file will appear. If the new filename has already been used, a warning_popup will appear that states: "The filename you specified is already used. Select a new filename." Click on the Continue button and the user is returned to the Clutter Region Filename window.

The site operator can enter in only 19 Clutter Regions files. If the operator creates a 20th file and clicks on the Save As button in order to bring up the Clutter Region Filename window, nothing happens. The operator must first delete a clutter regions file (Default file is not one that can be deleted) before adding a new file if there are already 19 site-created files saved and listed in the Clutter Region Files window.

To sensitize the Save and Delete buttons of the Clutter Region Files window, the URC password must be successfully entered. Once the padlock is open, the user can select an existing file, make changes

to it, and save it under the same existing name. Clicking on the Save button will open a warning_popup that states: "Are you sure you want to save your clutter regions changes?" Click on Yes, and the changes will be made to the Clutter Region File highlighted by the black bar. Click on No and the changes remain in the window, all buttons remain sensitized, and the user remains at the Clutter Region Files window.

NOTE

Saving the site-specific clutter files using the Save button places the files into a temporary memory file. In order to save them to the baseline, the operator must use the Update button. This updates the baseline but that is still only in memory, and the clutter files may still be lost if there is an emergency shutdown of the RPG. To preclude an accidental loss of the site-specific clutter files, it is **STRONGLY RECOMMENDED** that, once the site-specific clutter files are made, saved, and baseline updated, to follow the procedures in Paragraph 2-3.13.2.1.6. Saving Adaptation Data, to save the adaptation data onto diskette. These procedures also move the clutter files from memory to the RPG hard disk. Then, in case of any sort of reboot, the site-specific clutter maps are restored from the RPG hard disk and are available for use.

Returning to the control buttons on the Clutter Region Files window, to delete a file, click on the file, then click on the Delete button and a warning_popup opens that states: "You are about to delete the selected clutter suppression regions file. Do you want to continue?" Click on either Yes or No and the appropriate action will be taken and the user returned to the Clutter Region Files window. If there is only the one default file left and the user clicks on the Delete button, a warning_popup opens that states: "You cannot delete the Default Clutter Suppression Region File." Click on Continue and the user is returned to the Clutter Region Files window.

Double-click on a selected file and its corresponding filters appear on the Clutter Region window. The title to the window displays the name and date/time the file was last changed. However, it has not yet been downloaded to the RDA. The user must click on the Download button as discussed below.

3.8.3.2 Undo and Download Buttons. The third button is the Undo button. By default it is sensitized. Once changes have been made on the graphic window, the Undo button becomes sensitized. By clicking on the Undo button, the changes are deleted, no warning_popup windows appear, the Undo button becomes grayed-out and desensitized, and the Baseline: Restore and Baseline: Update buttons become sensitized.

The fourth button is the Download button. By default it is grayed-out and desensitized. If no edits have been made and the Download button is clicked, a warning_popup appears that states: "You are about to download the currently displayed clutter regions file. Do you want to continue? Yes/No?" Click Yes to download, click No to not download, and in both cases the operator is returned to the Clutter Regions window. If edits have been made on the edit screen, then clicking on the Download button brings up the same warning_popup that states: "You are about to download the currently displayed clutter regions file. Do you want to continue? Yes/No?" Click No and the operator is returned to the Clutter Regions window. Click Yes and a different warning_popup appears that states:

"You made edits but did not save them. You must save edits for them to be downloaded to the RDA. Do you want to save them and download or abort? Continue/Abort?" Click on Continue and the Clutter Region Filename window appears to enter the desired filename. (See Figure 3-18. Clutter Region Filename. Type in the desired Label: and click Accept to save the edits. Click on Cancel to return to the Clutter Regions window and not save the edits.) Click on Abort and the operator is returned to the Clutter Regions window but the edits are still in the edit screen.

The RDA will update its map only for the updated regions. The unmodified regions of the downloaded map will have no impact on the RDA map. At the end of the current volume scan, this will become the new clutter suppression map. This map will be used until another map is downloaded. Even though clutter suppression regions are specified by VCP, once the clutter map is sent to the RDA, the RDA invokes it regardless of the VCP.

3.8.3.3 Baseline: Restore and Baseline: Update Buttons. The next two buttons are the Baseline: Restore and Baseline: Update buttons. By default, the Baseline: Restore and Baseline: Update buttons are initially grayed-out and desensitized. When the password is successfully entered, the Baseline: Restore and Baseline: Update buttons are sensitized. When changes are made to the data, the Save and Undo buttons become sensitized while the Baseline: Restore and Baseline: Update buttons become grayed-out and desensitized. Once the changes have been saved or undone, then the Save and Undo buttons are grayed-out and desensitized and the Baseline: Restore and Baseline: Update buttons become sensitized.

To restore the baseline figures to the clutter regions, click on the Restore button. A warning_popup opens that states: "You are about to restore the clutter regions adaptation data to baseline values. Do you want to continue?" Click on either Yes or No and the appropriate action will be taken.

NOTES

If the user made any changes to existing files or added new files and saved them, they will still be DELETED if the Restore button is clicked. The user **MUST FIRST** click on the Update button and place the changes or new files into the baseline before using the Restore button.

The Update button updates the baseline but that is still only in memory, and the clutter files may still be lost if there is an emergency shutdown of the RPG. To preclude an accidental loss of the site-specific clutter files, it is **STRONGLY RECOMMENDED** that, once the site-specific clutter files are made, saved, and baseline updated, to follow the procedures in Paragraph 2-3.13.2.1.6. Saving Adaptation Data, to save the adaptation data onto diskette. These procedures also move the clutter files from memory to the RPG hard disk. Then, in case of any sort of reboot, the site-specific clutter maps are restored from the RPG hard disk and are available for use.

To incorporate the changes or files just made into the baseline, click on the Update button and a warning_popup opens that states: "You are about to update the baseline Clutter Regions adaptation data. Do you want to continue?" Click on either Yes or No and the appropriate action will be taken. The Baseline files will be modified with the latest changes and files.

3.8.3.4 Last Download Time. The next to last item in this top row is information only. The title Last Download Time will identify either the date and time of the last download or state Unknown.

3.8.4 Graphics Utilization.

There are five areas that graphically display or control the display of the clutter regions. These are described separately below.

3.8.4.1 Current Display - Black Rectangular Square. The black rectangular square with the white radius circle is the graphic box that is used to display the clutter regions for each selected file and is where the changes can be made with the mouse, using the click, hold down, drag, and release technique.

The upper left hand corner contains the readout of the azimuth and range of the cursor from the center of the display when it is moved around within the square. This feature cannot be modified except for the units (km versus miles) in which the range is displayed.

If the password has not been entered, the current existing clutter region files can be viewed, but not modified. If the password has been successfully entered, then the selected files can be modified or new files created.

NOTE

In order to “draw” new clutter regions, the display has to be in Sector Mode. (Right hand side of top line of commands under the Current Display.)

The background on the display will be either a reflectivity product, a CFC product, or the statement Background Product Not Available.

3.8.4.2 Bypass Map Displays: Doppler Channel and Surveillance Channel. On the right hand side of the window there are two large circular Bypass Map displays. The top display is the Doppler Channel and the bottom display is the Surveillance Channel.

The colors inside each display represent the region defined, are user selectable, and are defined in the color bar scales beneath the two displays. The color options for the Bypass Map are purple (NWM - Notch Width Map), green (Low), yellow (Medium) and orange (High). The NWM is the Default Bypass Map, and has the same default conditions as Region 1 of the clutter files (medium suppression on the surveillance channel, high suppression on the Doppler channel.) The NWM turns both Circular Bypass Map Displays totally purple, and can only be invoked by deleting all the regions in the table. It is not recommended to delete the Region 1 as that is the default map. If the operator accidentally deletes it, however, simply close the Clutter Regions Window, then reopen it and the Region 1 file will reappear. The color options for the Bins selected are Low (dark blue), Medium (light blue), and High (teal green). To select a different value, go to the table in the center lower portion of the window. Instructions are discussed below. Default values for the Bypass Map are High (orange) for Doppler Channel and Medium (yellow) for Surveillance Channel.

3.8.4.3 Bypass Map Display - Selections and Options. Directly below the display are user selections that affect the display. These selections are in two rows and consist of the following:

3.8.4.3.1 Segment: Low/High. The top row has two command options for the user. The first is Segment: Low or High. Click on the button to the left of each category or on the name itself. If the button is white, then that is the selected option. If it is brown, it is not selected. When a change is made from one to the other, the current display is refreshed with the new option, and the table of the segments on the bottom of the window is also updated. Default option is the Low segment.

3.8.4.3.2 Mode: Zoom/Sector. The second command is the Mode: Zoom or Sector, followed by a Reset Zoom button. Click on the button to the left of each category or on the name itself. If the button is white, then that is the selected option. If it is brown, it is not selected. Default option is the Sector mode.

When the display is in Zoom mode, clicking anywhere on the current display will zoom up to five times magnification, one click at a time. Each click doubles the magnification. At any time, in order to reset the zoom feature to the original level, click once on the Reset Zoom button and the current display is restored to its original scale.

When Zoom Mode is selected, maximum zoom is 5X magnification and can be accomplished with five (5) single clicks on the area of interest in the display. Each click increases the magnification. To reset the zoom feature to the original scale, click on the Reset Zoom button.

When the Mode: is Sector, the operator can create new clutter regions in the edit field by use of the mouse. Click on a starting point inside the field and drag the mouse to create the desired region. Moving the mouse clockwise will create an arc clockwise. Increasing in distance from the center will form a region further away from the center. Decreasing in distance from the center will form a region toward the center. Moving the mouse counterclockwise will create a region of 360 degrees minus the amount moved. The same movement away from or toward the center will make the same similar sized region.

The maximum number of regions allowed are fifteen. If the operator attempts to make more than fifteen, a warning_popup appears that states: "The maximum number of regions (15) has been reached. You must first delete an existing region before adding a new one. Continue" Click on Continue and the operator is returned to the Clutter Regions window.

3.8.4.3.3 Units. The units are selectable between Km and NM. Click on the button to the left of each category or on the name itself. If the button is white, then that is the selected option. If it is brown, it is not selected. When a change is made from one to the other, the cursor to the current display is changed and the table of the segments on the bottom of the window is also updated.

3.8.4.3.4 Background Product. The second line of command options starts with the title Background: and provides the operator with two choices: a specific product or a CFC product. There is a select button just to the left of either choice. When the button is white, then that choice is the product shown as the background on the display window on the top left half of the window.

3.8.4.3.4.1 Specific Product. The first choice with a selector button is a specific product with a pull down menu available directly under the selector button and the currently selected product. Click on the pull down menu and, with the help of the scroll bar on the left hand side of the menu, the operator can select from the following products which one will be the background product. See Figure 3-18.

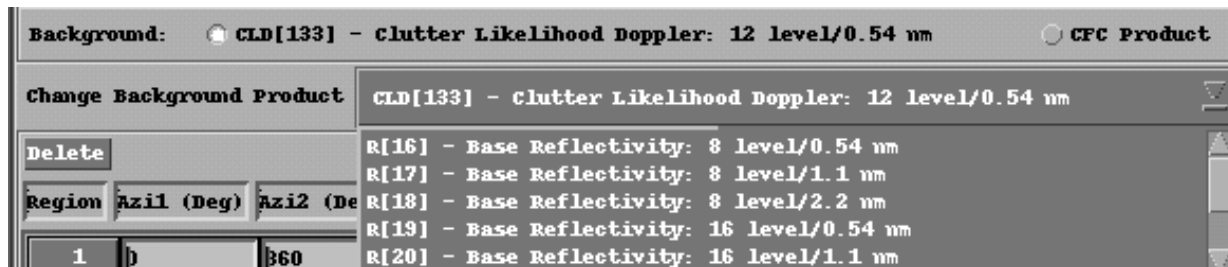


Figure 3-18. Clutter Background Pull-Down Menu

The options are:

- R[16] - Base Reflectivity: 8 level/0.54 nm
- R[17] - Base Reflectivity: 8 level/1.1 nm
- R[18] - Base Reflectivity: 8 level/2.2 nm
- R[19] - Base Reflectivity: 16 level/0.54 nm
- R[20] - Base Reflectivity: 16 level/1.1 nm
- R[21] - Base Reflectivity: 16 level/2.2 nm
- CLR[132] - Clutter Likelihood Reflectivity: 11 level/0.54 nm
- CLD[133] - Clutter Likelihood Doppler: 12 level/0.54 nm

Click on the desired product and, if it has already been generated, the product will appear as the background product in the display screen. If the product is not available, it will display a message on the screen "Product not generated" and create an automatic request to be generated at the next volume scan. Leave the cursor on the desired product and, once the next volume scan is complete, the new product will then be available.

It does not automatically appear in the display screen, however. The operator needs to refresh the display screen by clicking on another product, and then returning and clicking on the desired product that was just generated. Only the last product that was selected will be generated (unless it is already defined in the product generation table as being generated or generated by a request from an external user).

3.8.4.3.4.2 CFC Product. When the second choice, CFC Product, is selected, the Pull Down menu disappears and is replaced by a line with two new options for the CFC Channel, Doppler or Surveillance. See Figure 3-19.

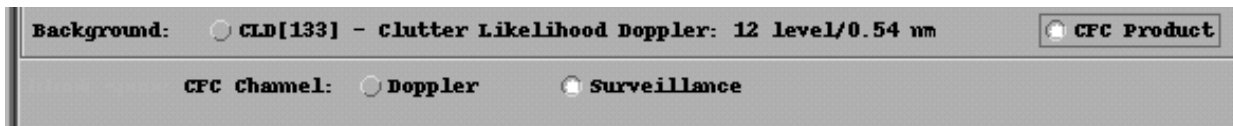


Figure 3-19. CFC Product Channel Selection

Click on either the button to the left of the title or the title itself to select the channel desired.

3.8.4.4 Low/High Elevation Segment Clutter Suppression Definition. This area allows for the modification and creation of clutter suppression regions. Each region is defined by: Azimuth and Range start and stop points, Select Code, and Notch Widths (Doppler and Surveillance Channels). The only password-protected area is for Baseline: Restore and Baseline: Update.

3.8.4.4.1 Delete Button. A Delete button is in the upper left hand corner of this area. Clicking on it will delete the region identified in the listing with a white background. The current display window will be refreshed with the deletion taking place. However, the change is not deleted in the file and can be restored by going to the Clutter Region Files window and double clicking on the desired file.

3.8.4.4.2 Azimuth Changes. To make changes to any region, click on the desired block and type in the desired change. The Azi1 block identifies the start of the region and the Azi2 block identifies the stop of the segment in a clockwise direction. The range of values allowed is from 0 to 360 degrees. If any number outside that range is entered, a warning_popup opens that states: “You entered an invalid number of XXX. The valid range is 0 to 360.” Click on the Continue button and the user is returned to the table.

3.8.4.4.3 Range Changes. The range of the region can be modified by entering in the starting and stopping distances from the center of the window in the Ran1 (start) and Ran2 (stop) blocks. The range of values allowed is from 1 to 275 NM (or 2 to 510 Km). If any number outside that range is entered, a warning popup opens that states: “You entered an invalid number of XXX. The valid range is 1 to 275 (or 2 to 510).” Click on the Continue button and the user is returned to the window.

The start range must always be less than the stop range. If a start range is entered that equals or is larger than the stop range, a warning_popup opens that states: “You entered an invalid start range (XXX). The start range must be less than the stop range (BBB).” XXX is the just entered start entry, BBB is the current stop range. Click on the Continue button and the user is returned to the table.

The stop range must always be greater than the start range. If a stop range is entered that equals or is less than the start range, a warning_popup opens that states: “You entered an invalid stop range (XXX). The stop range must be greater than the start range (CCC).” XXX is the just entered stop range, CCC is the current start range. Click on the Continue button and the user is returned to the window.

3.8.4.5 Select Code. For each region, the user can select an appropriate Select Code. These choices are: Bypass Map, All Bins, or None. Under the column heading Select Code, click through the

choices of Bypass Map, All Bins, or None until the desired one is displayed. The displays on the right hand side of the window will be refreshed each time the choice is changed.

3.8.4.6 Doppler and Surveillance Channel (Notch Width). For each region, the user can select an appropriate notch width for Doppler and Surveillance Channel. The choices are: Low, Medium, and High. The displays on the right hand side of the window will be refreshed each time the choice is changed.

3.8.5 Clutter Contamination Impact on Meteorological Data Interpretation.

Ground clutter is generally defined as radar return from non-meteorological, ground-based targets. Ground clutter is usually limited to within 20 to 30 NM of the RDA site and to the lowest elevation slices. However, in rough terrain and under certain meteorological conditions, clutter contamination may be present to the furthest extent of the radar coverage area and may affect several elevation slices.

Ground clutter contamination has a significant effect on the accuracy of the base data estimates. Clutter-induced bias of base data not only brings into question the reliability of data presented on the base products, but also has a detrimental effect on all downstream algorithms.

Recovery of usable meteorological data from range bins contaminated by ground clutter return is the primary purpose of the clutter suppression technique employed by the WSR-88D. The amount of data that can be recovered and the reliability of the reflectivity, velocity and spectrum width estimates from clutter contaminated range bins are functions of the active clutter suppression filter and the characteristics of the clutter itself. In the following paragraphs, the clutter suppression process is explained along with data improvements attainable with proper implementation of clutter suppression, pitfalls associated with improper clutter suppression application, and suggested operational methods to optimize the effectiveness of clutter suppression implementation.

3.8.6 Base Data Estimate Bias Due to Ground Clutter Contamination.

Ground clutter targets, by the very nature of their composition, are very efficient reflectors of electromagnetic energy. The innate ability of ground clutter targets to reflect more energy than nearby meteorological targets allows the clutter return to dominate the returned energy (power) for the affected range bin (See [Figure 3-20](#)).

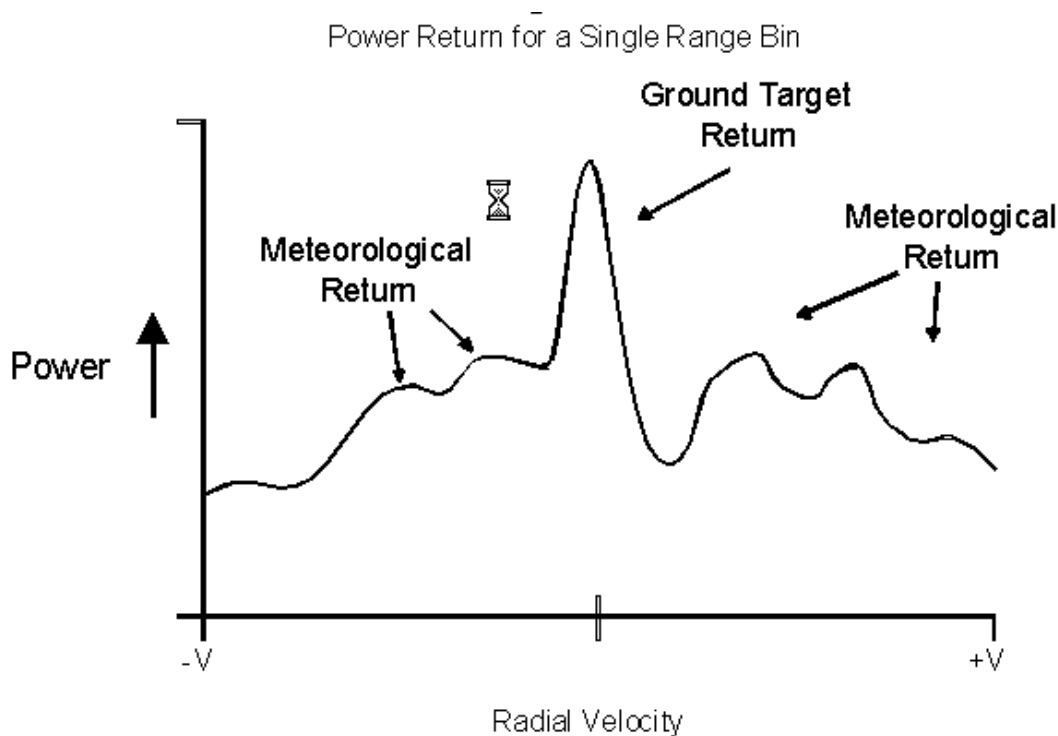


Figure 3-20. Base Data Estimate

A range bin is .13 nm (250 meters) in range by 1 degree in azimuth. Each range bin is made up of a number of range resolution cells. A range resolution cell is 1/2 pulse length (.13 nm) deep by one range sweep wide. A range sweep is defined as the azimuthal width of the area sampled by a single pulse which falls within the radial of interest. (The number of range sweeps per range bin varies based on the number of pulses per degree; therefore, the width of the range resolution cell also varies.) If the beam center line falls within the radial of interest, the data returned from that pulse is assigned to a range resolution cell location within a range bin for that radial. All range resolution cell values in a given range bin are used in calculating the base data estimate for that bin.

The base data estimate for each range bin is calculated using return from each range resolution cell contained within the confines of the range bin.

3.8.6.1 Reflectivity (Z) Estimate. Reflectivity is the measure of the efficiency of a target to reflect (absorb and re-radiate) radar energy. It is calculated by averaging the echo power from four successive range bins and then normalizing this average power for atmospheric attenuation and system noise. In general, clutter contamination will cause significantly higher reflectivity estimates because of the highly reflective nature of ground targets and the dependence of reflectivity (Z) on the magnitude of returned power.

3.8.6.2 Mean Radial Velocity (V) Estimate. Mean radial velocity is a power-weighted average of the

motions from each radar range resolution cell contained within the range bin. Ground clutter return that dominates the echo power return for a given range resolution cell will produce a velocity estimate near zero knots for that range resolution cell. The velocity estimate for each range bin is calculated by measuring and averaging the rate of change between data points assigned to adjacent range resolution cells contained within the bin. Therefore, ground clutter return present in the range bin will bias the velocity estimate toward zero.

3.8.6.3 Spectrum Width (W) Estimate. Spectrum width is a measure of the velocity difference between adjacent range resolution cells within a range bin. Any clutter contamination in the velocity estimate will also affect the spectrum width estimate.

3.8.6.4 Impact. The impact that the dominating clutter power return has on the base data estimates can be substantial. Additionally, the clutter-induced bias in the base data estimates affect the performance of ALL WSR-88D algorithms and products.

Clutter suppression for the WSR-88D is performed on each .13 nm by 1 degree range bin prior to the calculation of the base data estimates. Therefore, with appropriate clutter suppression invoked, the bias of the base data estimates due to clutter contamination within the range bin can be minimized.

3.8.7 Simplified Conceptual Model of Clutter Suppression Filter.

Clutter is the radar return from non-meteorological, ground-based targets, either man-made or natural. Meteorological returns have a mean radial velocity which may fall anywhere within the Nyquist co-interval and produce a spectrum width of up to several meters per second. However, clutter returns consistently produce signals with near zero (<0.97 kts) radial velocities and narrow (<0.2 kts to 0.6 kts) spectrum widths. These characteristics of clutter return allow the WSR-88D to employ filters to remove or reduce the power contribution from clutter, thereby decreasing its influence on base data estimates.

Clutter suppression filters are designed to reduce signal power whose mean radial velocity is at or near zero knots. To do this, clutter suppression filters reduce signal power within a “notch width” centered about the zero mean radial velocity value. This reduction in signal power effectively decreases the clutter's power contribution in the given range bin. To maintain meteorological return integrity, only the signal power whose radial motion falls within the notch width is reduced.

Remember, the goal of clutter suppression is to reduce only the power return contributed by clutter targets from the range bin prior to the calculation of the base data estimates. Therefore, for each range bin in areas where clutter suppression is in effect, the portion of the power return with near zero radial velocity will be reduced (filtered).

Any clutter return (power) not completely removed by the clutter filter is known as residual clutter. This residual clutter will be included in the calculation of the base data estimates for the range bin in which it resides.

3.8.8 Overview of WSR-88D Clutter Suppression.

The WSR-88D provides for the suppression (reduction) of returned power whose radial velocity is near zero knots within predefined areas. The signal processor uses the Bypass Map, Default Notch Width Map, and operator-defined Clutter Suppression Regions to determine the areas in which to invoke suppression, and the amount of signal reduction to apply. The Bypass Map and Default Notch Width Map are used to identify and suppress areas of known ground clutter return. The operator may control the application of clutter suppression to known ground clutter areas and transient areas through the definition of clutter suppression regions. A brief definition of the clutter suppression options follows.

3.8.8.1 Default Notch Width Map. The Default Notch Width Map consists of up to three concentric range definitions and includes a notch width value and an operator select code for each defined range. These definitions are ROC-controlled RDA adaptable parameters, not editable at the HCI. The current configuration specifies the Bypass Map in control and applies medium suppression to the Surveillance (reflectivity) channel and high suppression to the Doppler (velocity/spectrum width) channel out to 280 nm.

3.8.8.2 Bypass Map. The Bypass Map, generated by the RDASOT program, identifies areas measuring 1.40 by .54 nm which contain return from normal ground clutter targets. Only these 1.40 by .54 nm identified areas will have suppression applied when the Bypass Map is in control.

3.8.8.3 Operator-Defined Clutter Suppression Regions. The HCI operator may specify up to 15 individual regions per each of the four Clutter Suppression Region Files (11, 21, 31, 32). (Note: Clutter Suppression Region Files are not associated with any specific VCP.) Each region is delineated by start and stop ranges, start and stop azimuths, and an elevation segment number. The elevation segment number specifies which set of predefined elevation slices to include within the region definition. The elevations included in the different segments are defined in the RDA adaptation data.

The Clutter Suppression Regions are used to control the application of clutter suppression within the defined area by selecting from the options listed below. Within each operator-defined region, the HCI operator has three choices to determine how filtering will be invoked.

3.8.8.3.1 No Clutter Suppression. Operator Select Code None. This selection will turn off all filtering, including the Bypass Map identified areas, within the confines of the operator-defined region.

3.8.8.3.2 Bypass Map in Control Using the Operator-Specified Notch Width. Operator Select Code Bypass Map. This selection will invoke the selected suppression level (notch width) for each area identified by the Bypass Map within the confines of the operator-defined region.

3.8.8.3.3 Forced Clutter Suppression Using the Operator-Specified Notch Width. Operator Select Code All Bins. This option forces the specified suppression level (notch width) for every range bin within the confines of the operator-defined region.

3.8.8.4 Notch Width Selections. There are three notch width selections, or levels of suppression, available for inclusion in the Default Notch Width Map definitions and Clutter Suppression Region

definitions (with Operator Select Codes Bypass Map or All Bins). The notch width determines the target motions, around the zero radial velocity, that will be subjected to signal power reduction (suppression). The Surveillance channel and Doppler channel are suppressed using different notch width values (see [Table 3-2](#)) to reduce base data estimate bias in the different channels.

3.8.8.4.1 Notch Width Selection 1. Invokes a suppression level of approximately 30 dB (Low). See [Table 3-2](#) for typical notch width values.

3.8.8.4.2 Notch Width Selection 2. Invokes a suppression level of approximately 40 dB (Medium). See [Table 3-2](#) for typical notch width values.

3.8.8.4.3 Notch Width Selection 3. Invokes a suppression level of approximately 50 dB (High). See [Table 3-2](#) for typical notch width values.

Table 3-2. Notch Width Selections and Suppression Values

Channel	1		2		3	
	kts	dB	kts	dB	kts	dB
Surveillance	3.38	≈30	4.85	≈40	6.79	≈50
Doppler	4.58	≈30	6.05	≈40	8.92	≈50

Note: By design, the notch widths vary based upon antenna rotation rate. Therefore, the value listed in is an approximation and varies with elevation angle and antenna rotation rate.

The final filtering applied to each radial is a compilation of the Default Notch Width Map, the Bypass Map and the operator-defined Clutter Suppression Regions. The Bypass Map and Default Notch Width Map control the application of clutter suppression for each range bin not contained within an operator-defined Clutter Suppression Region. The operator-defined Clutter Suppression Regions have precedence for the application of clutter suppression. The hollow squares are areas previously defined for suppression by the Bypass Map, but are superseded by the operator-defined Clutter Suppression Regions.

In the absence of any operator-defined Clutter Suppression Regions, the WSR-88D will use the Bypass Map to determine where to apply clutter suppression and the Default Notch Width Map notch width definitions (stored RDA adaptation data) to determine the amount of suppression to be applied.

3.8.9 Negative Impacts of Inappropriate, Operator-Forced Clutter Suppression.

Forcing clutter suppression (Operator Select Code All bins) for every range bin within an operator-defined region will effectively remove the power contribution of non-moving targets from the base data estimate. This strategy is appropriate to temporarily mitigate the effects of anomalous propagation. However, caution is warranted when such a strategy is employed as a long term solution for removal of clutter contamination from the base data estimates.

3.8.9.1 Zero Isodop Apparent in the Reflectivity Field. The clutter suppression technique employed by the WSR-88D applies power reduction factors to “clutter” returns to reduce their impact on valid meteorological data. The portion of the signal attributed to “clutter” is identified by its lack of motion. The WSR-88D applies a power reduction factor to the non-moving returned signal.

The WSR-88D sees only the radial component of the actual target motion. Therefore, if the target is moving perpendicular to the radar beam it has a zero (or near zero) radial motion. If clutter suppression has been invoked for a given range bin whose radial target motion is zero (or near zero), the defined power reduction factor will be applied to that bin. This power reduction will result in a significantly reduced reflectivity estimate for the range bins whose mean radial velocity is at or near zero.

3.8.9.2 Data Smearing. Data smearing is an artificial displacement of the returned power maxima into azimuthally adjacent range resolution cells. Data smearing is an artifact of the clutter filter response times and occurs when high reflectivity gradients are present. The clutter filter decay rate is slower with narrower notch widths, therefore, data smearing is more likely to be seen when low suppression levels are used.

When data smearing occurs, weak reflectivity features on the trailing edge (azimuthally) of a high reflectivity gradient may be obscured. Additionally, the apparent areal extent of high reflectivity will be increased. The impacts of data smearing on the velocity and spectrum width estimates vary depending upon the relative power contributions from the range resolution cells for the affected range bin.

Base data estimate bias introduced by clutter suppression filters can be mitigated by invoking clutter suppression regions only in areas where clutter is present.

3.8.10 Benefits Attained by Appropriate Clutter Suppression.

The most obvious improvement as a result of proper clutter suppression is that ground clutter is removed from the graphical products displayed at the user workstation. However, several more important data quality improvements can be realized by the intelligent application of clutter suppression.

3.8.10.1 Improved Base Data Accuracy. The most important benefit is the improved accuracy of the WSR-88D products. Since clutter suppression occurs prior to the calculation of the base data estimates, proper clutter filtering will result in the base data estimates being more representative of the actual meteorological situation. Consequently, the more accurate the base data estimates, the more reliable the output from downstream processing and algorithms and, as a result, the more accurate

base and derived products.

3.8.10.2 Increased Availability of Second-Trip Velocity and Spectrum Width Data. By removing (reducing) the power contribution of ground targets from the base data estimate for first-trip range bins, the likelihood of assigning valid velocity and spectrum width data to second-trip range bins is increased.

The range unfolding of velocity (and spectrum width) data is a two-step process. First, the occurrence of overlying range bins (data from two or more range bins appearing at the same range due to multi-tripping of the high Doppler PRF) is determined by range folding the return at the surveillance PRF into the Doppler PRF intervals. If the difference in power of the two (or more) range bins being compared is less than or equal to the user-specified power difference (Range Unfolding Overlay Threshold - TOVER), both range bins are flagged as range folded (obscured). If the difference in power is greater than the specified power difference, the velocity data are assigned to the range bin having the greater power. The range bin with the weaker power is then flagged as range folded (obscured). In the situation of second (or third) trip meteorological return compared with strong clutter return from close to the radar (first trip), the return power of the clutter will usually exceed the meteorological power return by the specified power difference (TOVER). Therefore, if the clutter is not suppressed, the clutter contaminated bin will be assigned the velocity (and spectrum width) data while the bin with real meteorological targets will be flagged as range folded (obscured).

NOTE

When velocity and spectrum width range bins are flagged as range folded, those range bins are treated as “missing” by all downstream algorithms.

3.8.10.3 Decreased Velocity Dealiasing Failures in Clear Air Mode. A large number of velocity dealiasing failures that occur in VCP 31 and VCP 32 can be attributed to ground clutter induced bias in the base velocity estimate. The removal of the ground clutter bias from the base velocity estimate will result in meteorologically plausible ambiguous velocity estimates. These ambiguous velocity estimates can then be readily dealiased by the dealiasing algorithm. However, residual ground clutter will continue to cause velocity dealiasing algorithm failures.

3.8.10.4 Improved Ability to Stay in Clear Air Mode. The Clear-Air Mode Deselection logic employed by the WSR-88D compares the areal coverage of precipitation-like return to a specified value (nominal clutter area plus precipitation area threshold). If the areal coverage of precipitation-like return exceeds this value, the RPG computer commands the RDA computer to switch to Precipitation Mode.

The reduction of non-meteorological data from the areal coverage computation will result in a more accurate estimate of the actual precipitation present; thereby, reducing the likelihood of prematurely switching to precipitation mode due to ground clutter returns. This also increases the accuracy of precipitation estimates by avoiding collection of precipitation on ground returns.

3.8.11 Suggested Clutter Suppression Management.

Proper clutter filtering will enhance the accuracy and readability of the base products as well as the reliability of the derived products. The following suggestions are made for improved clutter suppression management.

- Generate a new Bypass Map on a seasonal basis. This should be done when the meteorological conditions allow standard radar beam propagation. In addition, generate a new Bypass Map whenever the “normal” ground clutter pattern changes (e.g., a high rise building is erected).
- Generate a hard copy of the 0.50 reflectivity product with and without Bypass Map clutter suppression in effect. These hard copies will give the forecasters a sense of the effectiveness of the clutter filter in dealing with the normal ground clutter return.
- Select a Clutter Suppression Region File to set aside as the baseline file. Using this file number, define two clutter suppression regions, one for each elevation segment number. These regions should encompass the entire radar coverage area, specify the Bypass Map in control (Operator Select Code Bypass Map), and use a notch width selection of Medium for the Surveillance channel and a selection of High for the Doppler channel. This Clutter Suppression Region File can be used to return to baseline clutter filtering after the requirement for forced clutter suppression (Operator Select Code All Bins) has abated.
- At the beginning of each shift, download the baseline clutter suppression region file. This baseline clutter suppression region file will negate any forced clutter suppression, thereby revealing any ground clutter still present. This will serve to ensure that the forecasters know what clutter suppression file is in effect and will enable them to make an informed decision as to whether any forced clutter filtering is required.
- Document any changes to operator-defined clutter suppression regions and a procedure for recording the date, time and file number each time a Clutter Suppression Region File is downloaded to the RDA. This procedure will ensure that everyone responsible for data interpretation can determine the active clutter suppression region file.

SECTION 3.9. BYPASS MAP EDITOR

3.9.1 Introduction.

Under the Applications column, click on the icon labeled Bypass Map Editor. This opens up the Clutter Bypass Map Editor window. See [Figure 3-21](#). The Bypass Map Editor, by default, loads and displays the edited bypass map data, not the baseline, when the window is first opened. (If there is no edited version, then it creates one from the baseline version. The baseline version is created when a new bypass map is generated at the RDA.).

For FAA Redundant configurations, the user can edit the Bypass Maps only on the RPG channel that is active. If the user tries to edit the maps on the non-active channel, access is not even allowed to the window. When clicking on the padlock to open the editable fields, a warning_popup opens that states: “You cannot edit this data because the other RPG channel is Active.” Click on the Continue button and the user is returned to the Bypass Map Editor window.

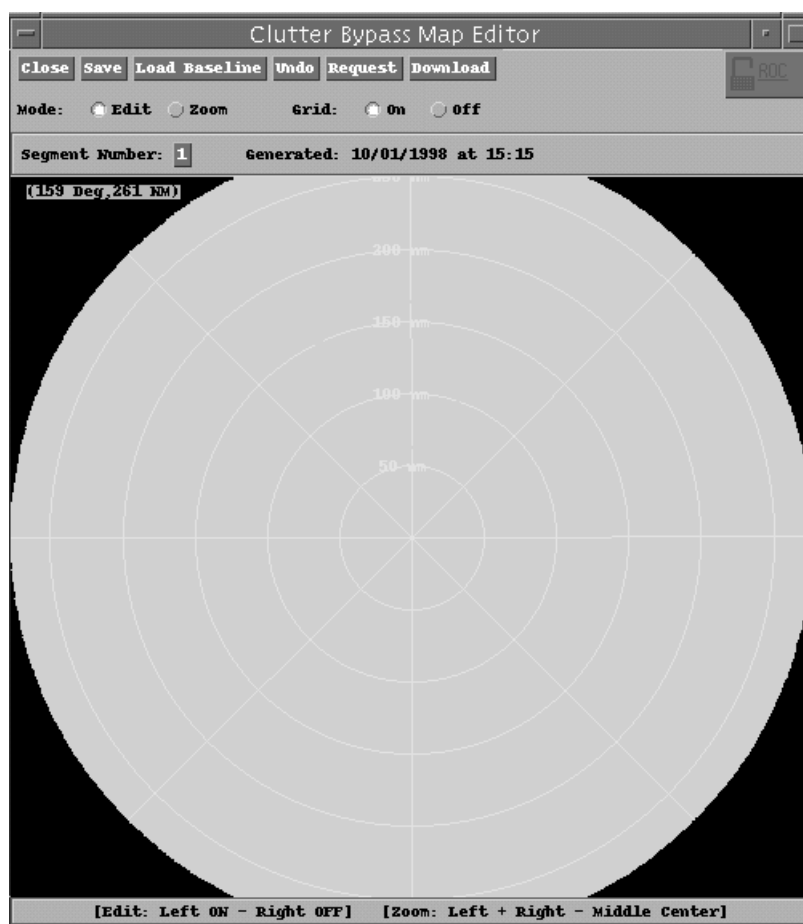


Figure 3-21. Clutter Bypass Map Editor

3.9.2 Top Row of Commands.

The top row contains seven buttons to be used when making changes to the Bypass Map.

3.9.2.1 Close Button. The first button to the far left is the Close button. If no changes have been made, clicking on the Close button will close the window and return the user to the HCI.

If changes had been made and the Close button is clicked (without any other buttons being selected), a warning_popup opens that states: "Do you want to save your bypass map edit changes?" Click on either the Yes or No button to select the desired response. The changes are either saved or deleted, and the user returned to the HCI.

3.9.2.2 Padlock Button. To open the password protected fields for edit, follow the procedures described in Paragraph 2.2.4.1.7.

When the padlock is unlocked, a warning_popup will appear that states: "If you want to edit the latest clutter bypass map you should first request one from the RDA (Request button), wait for it to be received at the RPG (a message should appear in the system log when it is received), and then load it (Load Baseline button)). Click on the Continue button and the user is now able to edit the clutter bypass map. If no data is available (the message "Bypass Map Data Not Available" is present in the middle of the display), the padlock will not work.

3.9.2.3 Save Button. By default the Save button is grayed-out and desensitized. It only becomes active once a change has been made to the Edit window. When the Save button is then clicked, a warning_popup opens that states: "Do you want to save your bypass map edit changes?" Click on either the Yes or No button, to select the desired response. If Yes, the changes are saved, the Save button grayed-out and desensitized, and the user returned to the Clutter Bypass Map Editor window. If No, the changes are not saved but are still on the Edit window, the Save button is still sensitized, and the user returned to the Clutter Bypass Map Editor.

If the user makes edits and then selects a different file from the clutter files list without first saving the edits, a warning_popup opens that states: "You are changing clutter files but did not save edits to the previous file. Do you want to save them?" Click on the Yes button to save the edits or click on the No button to discard the previous edits. In both cases, the Save and Undo buttons become grayed-out and desensitized. The user can also tab the red outline to the desired response and press the Return key or Space Bar.

The clutter suppression regions adaptation data consists of up to 20 files. Since only one file can be edited at a time, edits must be saved when changing files or the edits are discarded. If another file is not selected, then the edits can be preserved unless the user selects the Undo button, in which case they are discarded.

3.9.2.4 Load Baseline Button. The third button from the left is the Load Baseline button. This button is by default grayed-out and desensitized. Once the password has been successfully entered, this button becomes sensitized. Click on the Load Baseline button and the latest RPG copy of the RDA generated clutter bypass map is copied into the local edit buffer for display and edit. It does not

replace the physical copy of the edited bypass map. The window turns to a black background and the bins that are active are in gray.

It is possible but difficult to edit this map because it is backward imaged. To add individual bins, right click in the window. To delete each individual bin, left click on the specific bin.

It is easier to modify and/or delete if the window is zoomed in several times.

3.9.2.5 Undo Button. Once any changes have been made to the edit window, the Undo button becomes sensitized. Clicking on the Undo button will erase all the most recent edits that have not been saved. There is no warning_popup that opens.

3.9.2.6 Request Button. Click the Request button to request the currently implemented bypass map from the RDA. This copies the current bypass map into the baseline file but does not yet make it visible to the operator. A message is written in the system log file when the RPG receives this latest clutter bypass map from the RDA. The operator must then click on the Load Baseline button to bring the newly rewritten baseline file into the edit window for display or modification.

3.9.2.7 Download Button. Once the password has been successfully entered, the Download button becomes sensitized. Click on this Download button when the user wants to download the Bypass map currently in the edit buffer to the RDA. A message will appear in the status log file that states the edited bypass map has been downloaded to the RDA. Once clicked, a warning_popup opens that states: "You are about to download a new clutter bypass map to the RDA. Do you want to continue?" Click on either Yes or No to select the desired response. The map is either downloaded or not, and the user is returned to the Clutter Bypass Map Editor. If downloaded, the new map will be incorporated at the start of the next volume scan.

3.9.3 Remaining Controls.

There are two more lines of controls that the user can utilize in making changes to the Bypass Map. The second row contains the Mode options: Edit or Zoom; and the Grid On/Off toggle control. The third row contains the Segment Number selection block.

3.9.3.1 Mode: Edit. In order to edit the window, the password must be successfully entered and the Edit button activated. If the button to the left of the title Edit is white, then it is activated. If it is brown, click on either the button or the Edit title, and the Edit capability becomes activated.

NOTE

This is a toggle switch between the Edit Mode and the Zoom Mode.

Using the mouse, place the cursor on the space containing bins which are to be activated in the Bypass Map. Click for individual bins, or click, hold down, drag, and then release for areas of bins. In order to erase or undo individual bins, place the cursor on the desired bins and right click. For larger areas to erase, continue to use the right button by the click, hold down, drag, and then release sequence.

It is easier to modify and/or delete bins if the window is zoomed in several times.

3.9.3.2 Mode: Zoom. In order to zoom or move the edit window, click the button to the left of the title Zoom or click on the title itself. Once the button has become white, the zoom feature is activated. It is not password protected and can be activated at any time. (This is basically a toggle switch between the Edit Mode and the Zoom Mode.)

Place the cursor on the point of the edit window that you want to enlarge, and left click once. The window will be magnified to twice its size, centered on the point you selected. To continue to magnify the point, continue to left click. The zoom feature can zoom up to five times itself, one click at a time. The grid is automatically resized to represent the size of the window.

In order to zoom back out, right click with the cursor on the point of the edit window that you want to decrease in size. To get back to the original window size, continue to right click until the desired size is achieved.

To recenter the edit window without zooming in or out, place the cursor over the point that you want to be the new center, and click once with the middle button of the mouse. The edit window will refresh with the new location now as the center of the edit window. In order to restore the window, move the cursor to the center of the overlay and click once with the middle button.

3.9.3.3 Grid On/Off. This is a toggle switch between the two options, On and Off. Click on either the buttons to the left of each option or on the titles themselves. The active option will have the button turned white. When a change is made, the edit window refreshes itself accordingly with or without the grid.

3.9.3.4 Segment Number. This is a toggle switch between the #1 Segment (Low elevation, encompassing 1.5 degrees and below) and the #2 Segment (High elevation, above 1.5 degrees). Move the cursor to the box containing the number 1 or 2 to the right of the title Segment Number: and click. The number changes and the edit window is refreshed with the corresponding bypass map.

3.9.4 Generated: Line.

The information displayed to the right of the title Generated: in the center of the third row of the window is for information only. It displays the date and time that the last Clutter Bypass Map was generated by the RDASOT. This field is not editable by the user.

3.9.5 Edit Window.

The rest of the window contains the Edit window. In the upper left hand corner of the window is an Azimuth/Range display that automatically displays the location of the cursor when it is moved in the window. The default window can be edited out to approximately 275 nm. The top and bottom (north and south) borders of the 360 degree circle are hidden from initial view by the boundaries of the window. If the user wants to edit these portions of the map, use the center button of the mouse to click on a new center point to displace the circle far enough to display the desired area.

SECTION 3.10. ENVIRONMENTAL DATA

3.10.1 Introduction.

Under the Applications column, click on the icon labeled Environmental Data. This opens up the Environmental Data Editor. See [Figure 3-22](#). This window is used to observe and edit the environmental winds. The environmental winds is a display of wind speeds and directions, at 1,000-ft height increments, from the ground to 70,000 ft. Speeds can be displayed in either kts or m/s. Winds speeds and directions are routinely updated on a volume scan basis by the VAD task when Auto VAD Update is active. Otherwise, the data will not be updated unless entered manually. Display values are used by the radial preprocessor task for velocity dealiasing and are sent to the radial preprocessor task automatically on a volume scan basis.

When the Environmental Data icon has a thick red outline, it signifies that the environmental winds have not been manually updated for the past twelve (12) hours. Once the winds have been updated, a thin red outline signifies that the Environmental Data window has been selected to be opened.

NOTE

For redundant configuration systems with two RPGs, the environmental data editable by the site does NOT get transferred from one channel to another when a change is made, nor when the channels are switched. These parameters are:

- 0 Deg C Height
- -20 Deg C Height
- Default Storm Motion

They will also NOT appear as a MISMATCH on the Adapt Times: line in the lower right hand corner of the RPG Control/Status window if the two channels have different values.

Changes made to these three values in the Environmental Data Editor are automatically transferred to the Hail Detection Algorithm and the Storm Cell Tracking Algorithm for that respective channel only.

Any changes to these three parameters should be made on the Environmental Data Editors for both channels at the same time to ensure optimum performance by the algorithms.

The environmental winds are also not transferred over during a channel switch. But the VAD Update option, when selected, will input the latest available wind data onto the new channel as each volume scan is completed.

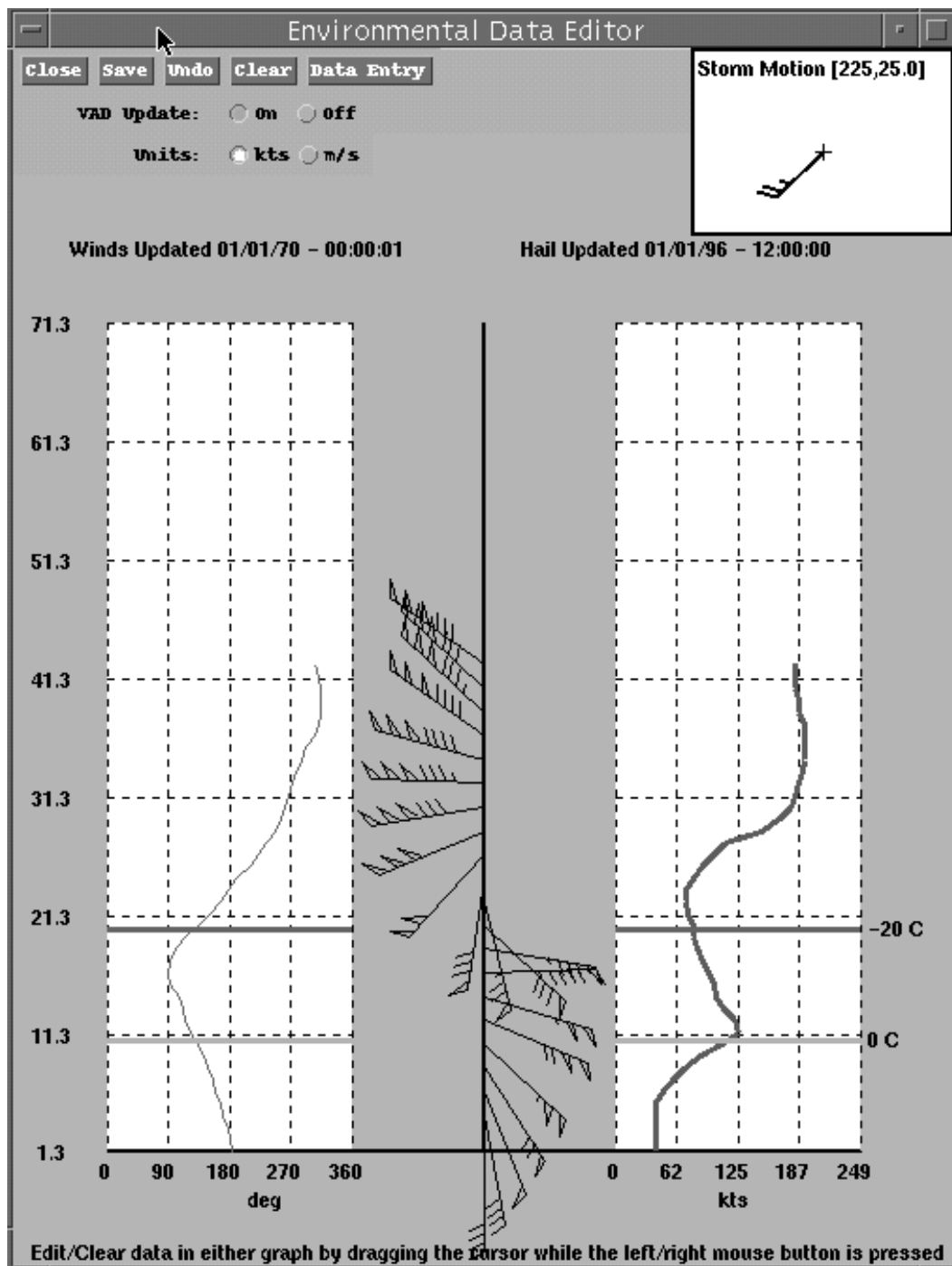


Figure 3-22. Environmental Data Editor

3.10.2 Top Row of Commands.

The top row contains five buttons for the user to utilize when making changes to the Environmental Data Editor window.

3.10.2.1 Close Button. The first button to the far left is the Close button. If no changes have been made, clicking on the Close button will close the window and return the user to the HCI.

NOTE

When changes are made, the VAD Update is automatically kept on.

If changes have been made and the Close button is clicked (without any other buttons being selected), a warning_popup opens that states: “You made changes, but did not save them. Do you want to save your changes?” Click on either Yes or No to select the desired response. The changes are either saved or deleted. If the VAD Update is off, then the user is returned to the HCI. If the VAD Update is on, then a second warning_popup opens that states: “Do you want to disable VAD Update?” Click on either Yes or No to select the desired response. If Yes, the VAD Update is turned off and the user returned to the HCI. If No, the VAD Update remains on and the user returned to the HCI.

3.10.2.2 Save Button. By default the Save button is grayed-out and desensitized. It only becomes active once a change has been made to the Edit window. When the Save button is then clicked, a warning_popup opens that states: “You are about to replace environmental adaptation data. Do you want to continue?” Click on either Yes or No to select the desired response.

3.10.2.2.1 VAD Update Off. If the VAD Update is off and the user clicks on Yes, the changes are saved, the Save button grayed-out and desensitized, and the user stays at the Environmental Data Editor window. If the user clicks on No, the changes are not saved but remain on the edit window, all buttons remain sensitized, and the user remains at the Environmental Data Editor window.

3.10.2.2.2 VAD Update On. If the VAD Update is on and the user clicks on Yes, a second warning_popup opens that states: “VAD Update is enabled. Do you want to disable it?” Click on either Yes or No to select the desired response. If the user clicks on Yes, the VAD Update is turned off, the changes are saved and the user remains at the Environmental Data Editor window. If the user clicks on No, the VAD Update remains on, changes are not saved but still on the edit screen, and the user remains at the Environmental Data Editor window.

3.10.2.3 Undo Button. By default the Undo button is grayed-out and desensitized. It only becomes active once a change has been made to the Edit window. When the Undo button is then clicked, all changes that had just been made (since the last Save) will be deleted and the user remains at the Environmental Data Editor window. There are no warning_popups with this button.

3.10.2.4 Clear Button. Click on the Clear button and all the existing wind data from the edit screen is removed. If changes had just been made, those changes are also removed. There are no warning_popups with this button.

3.10.2.5 Data Entry Button. There are two ways to enter data into the environmental database. The first way is to click on the Data Entry button and the Environmental Data Entry window opens. See [Figure 3-23](#). On this window, the data is entered via the keyboard. (The second way is to click and drag on the edit window. That method is discussed in paragraph [3.10.5](#)).

Environmental Data Entry

Close Save Undo Clear

Environmental Winds Data

Coded Msg (PPBB):

☒ Interpolate between levels

Lvl kft	Dir deg	Spd kts
1.3	<input type="text"/>	<input type="text"/>
2.3	<input type="text"/>	<input type="text"/>
3.3	<input type="text"/>	<input type="text"/>
4.3	<input type="text"/>	<input type="text"/>
5.3	<input type="text"/>	<input type="text"/>
6.3	<input type="text"/>	<input type="text"/>
7.3	<input type="text"/>	<input type="text"/>
8.3	<input type="text"/>	<input type="text"/>
9.3	<input type="text"/>	<input type="text"/>
10.3	<input type="text"/>	<input type="text"/>
11.3	<input type="text"/>	<input type="text"/>
12.3	<input type="text"/>	<input type="text"/>
13.3	<input type="text"/>	<input type="text"/>
14.3	<input type="text"/>	<input type="text"/>
15.3	<input type="text"/>	<input type="text"/>
16.3	<input type="text"/>	<input type="text"/>
17.3	<input type="text"/>	<input type="text"/>

Hail Temperature Heights

Last Update: 01/01/96 - 12:00:00

Height -20 C (0-70 kft MSL)

Height 0 C (0-70 kft MSL)

Default Storm Motion

Direction (0-360 deg)

Speed (0-99.9 kts)

Figure 3-23. Environmental Data Entry

The top row contains four buttons. In the upper left hand corner, clicking on the Close button closes the Environmental Data Entry window and returns the user to the Environmental Data Editor. If changes have been made but not saved, the Save and Undo buttons on the Environmental Data Editor window are now sensitized and provide the user the opportunity to save the changes. If the Close button on the Environmental Data Editor is clicked also without saving any changes, then the user is led through the same process of warning_popups as is described above in paragraph [3.10.2.1](#).

Once changes have been made, the Save button becomes sensitized. Clicking on the Save button brings up a warning_popup opens that states: “You are about to replace environmental adaptation data. Do you want to continue?” Click on either Yes or No to select the desired response. The data is either saved or remains in the edit field and the user remains at the Environmental Data Entry window.

By default the Undo button is grayed-out and desensitized. It only becomes active once a change has been made to the Edit window. When the Undo button is then clicked, all changes that had just been made (since the last Save) will be deleted and the user remains at the Environmental Data Entry window. There are no warning_popups with this button.

Click on the Clear button and all the existing wind data from the edit screen is removed. If changes had just been made, those changes are also removed. There are no warning_popups with this button.

3.10.2.5.1 Environmental Winds Data. The left hand side of the window is titled Environmental Winds Data. The first line contains the entry block for the Coded Msg (PPBB): Enter in the coded Significant Level winds from a local sounding. Start with the five-digit height indicator code “9XXXX”, followed by the three wind speed and direction five-digit codes for the respective heights. Type in the PPBB data exactly as the coded message is viewed. Include all the /// marks and the = (equal) sign at the end of the transmission. Once all the desired levels have been entered and the = (equal) sign added to the end of the data, press the Return key and the data will be displayed on the tabular data below this entry and on the two vertical windows in the Environmental Data Editor window.

The second line is a toggle switch (on/off) to interpolate between levels. Clicking on the square box to make it turn white with a black check mark makes the interpolate function active for all data entered. Clicking on the box to make it return to the brown background color with no check mark in it verifies that the interpolation window is turned off. When the interpolation is turned on, it interpolates all the blank fields from the first data point entered to the last data point entered. Both wind speed and wind direction have to be inserted in order for the interpolation to take place.

The remainder of the block has three columns. The left hand column is the altitude in thousands of feet, from the surface to 70,000 feet AGL. The user can select any altitude and insert the direction in degrees of the wind and the temperature. Click on the boxes to the right of the desired altitude, delete the current numbers (if desired), and enter in the new desired value. For wind direction, the range is 0 to 360 degrees. If a number greater than 360 degrees is entered and the Return key pressed or another block clicked on, a warning_popup opens that states: “You entered an invalid direction of XXX. The valid range is 0 to 360.” Click on the Continue button and the user is returned to the Environmental Winds Data window. For wind speed, the range is 0 to 249 kts (0 to 128 m/s). If a number greater than 249 kts (128 m/s) is entered and the Return key pressed or another block clicked on, a warning_popup opens that states: “You entered an invalid value of XXX. The valid range is 0 to 249 kts (0 to 128 m/s).” Click on the Continue button and the user is returned to the Environmental Winds Data window. Use the sliding gray bar to the right hand side of the winds data table to select the entire range of altitudes.

3.10.2.5.2 Hail Temperature Heights. The upper right hand block is labeled Hail Temperature

Heights and provides the user the opportunity to edit the heights of the 0 degree and -20 degree temperature level. The first line of information labeled Last Update: reflects the last date/time that either of the temperature levels were modified. This field is not editable by the user but is for information only.

Click on the box to the right of the title Height -20 C (0 to 70 Kft MSL) and enter in the desired values. Follow the exact same procedure for the Height 0 C (0 to 70 Kft MSL) level. The allowable altitude range for both temperatures is 0 to 70 Kft. If an incorrect altitude value XX is entered, a warning popup opens that states: “XX is out of range, must be in the range 0.000 <= X <= 70.000.” Click on the Continue button and the user is returned to the Environmental Data Entry window.

Once allowable Heights are made for either value, the new values are automatically transposed to the graphical display in the Environmental Data Editor window. The user can return to the Environmental Data Editor window and observe the newly entered values as colored horizontal lines in the Direction and Speed vertical displays. The -20 deg C height is a dark blue horizontal line; the 0 deg C height is an aqua horizontal line.

3.10.2.5.3 Default Storm Motion. The second block (from the top) on the right hand side is the Default Storm Motion entry blocks. There are two values the user can enter: Direction and Speed.

Click on the box to the right of the label Direction (0 to 360 degrees) and, using the keyboard, enter in the desired Default Storm Motion direction. The allowable range is 0 to 360 degrees. Press the Return key or click onto another block. If an incorrect value is entered, a warning_popup opens that states: “XXX is out of range, must be in the range 0 <= X <= 360.” Click on the Continue button and the user is returned to the Default Storm Motion portion of the window.

To modify the Default Storm Motion Speed, click on the box to the right of the label Speed (0 to 99.9 kts) and, using the keyboard, enter in the desired speed. The allowable range is 0 to 99.9 kts. If an incorrect value is entered, a warning_popup opens that states: “XXX is out of range, must be in the range 0.000 <= X <= 99.900.” Click on the Continue button and the user is returned to the Default Storm Motion portion of the window. If a blank space is entered between numbers, a different warning_popup opens that states: “X X is not a valid integer for type Default (Direction)” or “X X is not a valid integer for type Default (Speed).” Click on the Continue button and the user is returned to the Default Storm Motion portion of the window.

Once either value or both values have been correctly entered, the entries are automatically transposed to the graphical display in the Environmental Data Editor window. The user can return to the Environmental Data Editor window and observe the newly entered values in the upper right hand corner of the window graphical display labeled Storm Motion (AAA,BBB) where AAA is the direction and BBB is the speed. The new default values will then be used at the start of the next volume scan by the Storm Track algorithm. That is assuming that there is no storm motion value already calculated based on existing storms.

3.10.3 VAD Update Commands and Units Selection Commands.

The second row of commands in the Environmental Data Editor window contains the selection of the VAD Update On or Off. The third row of commands contains the selection of wind speeds in either kts or m/s.

3.10.3.1 VAD Update. The commands for VAD Update consist of an On and Off selection with a sensitized button just to the left of each choice. When the VAD Update is On, the button to the left of On is green. When the VAD Update is Off, the button to the left of Off is red. Click on either the button or the title, and the VAD Update is changed. These two options toggle between each other.

3.10.3.2 Wind Speed Units. The commands for selecting the Wind Speed units consist of the two titles: kts and m/s with a sensitized button just to the left of each choice. The units that is currently displayed in the windows has a white button to the left of the title. To change to the other unit, click on either the button or the title, and the units are changed. These two buttons toggle between each other. When the user clicks on the sensitized button/title, the corresponding units are changed in the Environmental Data Editor window and in the Environmental Data Entry window. The Storm Motion units does not change, however, but stays in kts. There are no warning_popups that appear with either of these selections.

3.10.4 Text Line of Last Updates.

The fourth line in the Environmental Data Editor window contains the text information of the last time (in date and time) the Winds were updated and the last time (in date and time) the hail was updated. This field is not editable by the user, but is automatically updated by the RDA.

3.10.5 Click and Drag Entries.

The second way to enter data into the environmental database is to click and drag on the edit window itself. Both the wind direction and wind speed vertical windows function the same. Move the cursor to the desired location and press down on the left button. A pencil figure will replace the cursor, and the user can now edit the values. Using the mouse, adjust the direction (or speed) to the desired values. The vertical lines are modified as the mouse is moved. If both wind speed and direction values are available at the same level, a graphical wind barb opens along the black vertical bar between the two windows.

These entries can also be confirmed by clicking on the Data Entry button and viewing the Environmental Winds Data table.

Directly above each vertical window is a white block that opens when the cursor is placed somewhere in each vertical window. For the wind direction, the white block displays the location of the cursor by showing a constant readout of height and direction. Heights are in thousands of feet and direction is in degrees. For the wind speed, the white block displays the location of the cursor by showing a constant readout of height and speed. Heights are in thousands of feet and speed is in kts or m/s, depending on the selected unit in the third row of command buttons.

The click and drag technique can also be used on the Default Storm Motion Window in the upper right hand corner of the Environmental Data Editor. Click and drag to the direction desired either clockwise or counterclockwise. The wind speed increases as the user drags away from the center point. The numerical values change at the same time in both the Default Storm Motion window and in the Default Storm Motion editable fields in the accompanying Environmental Data Entry window.

NOTE

Be very careful when clicking and dragging in the Storm Motion corner window. The operator may intend to change just the direction, but can easily modify the wind speed also depending where along the wind barb the cursor is clicked. The wind speed click and drag is very sensitive along the entire length of the barb. Recommend both values be checked (after clicking and dragging) in either the top row text line of the Storm Motion corner window or in the Default Storm Motion section of the Environmental Data Entry window.

The 0 degree and -20 degree Hail Temperature Heights are easily modified by the Click and Drag function. Position the cursor on the black title of each respective height line along the right hand side of the wind speed column. Press and hold down the left button, and drag the height line either up or down until the desired height is reached. Once at the desired height, release the left hand button. Repeat if desired for the other height line. The Hail Temperature Heights are now temporarily set at the new values. The corresponding new heights will also appear in the Environmental Data Entry window, upper right hand section, in the blue blocks in the Hail Temperature Heights section. The operator must now save those changes by clicking on the Save button of either the Environmental Data Entry window or the Environmental Data Editor window. (Both Save buttons become sensitized once either one of the hail temperature heights lines have been repositioned.) Once the Save has been completed, the new date and time will be shown on the Last Update: text string of the Environmental Data Entry window and the Hail Updated: text string on the Environmental Data Editor.

3.10.6 Red Outline, Environmental Data Icon, HCI.

When the Environmental Data icon has a thick red outline, it signifies that the environmental winds have not been manually updated for the past twelve (12) hours. Once the winds have been updated, a thin red outline signifies that the Environmental Data window has been selected to be opened.

SECTION 3.11. PRECIPITATION DETECTION FUNCTION

3.11.1 Introduction.

The Precipitation Detection Function (PDF) examines the total area of reflectivity, plus assumed Nominal Clutter Area (NCA), within 124 nm of the radar against several reflectivity and area thresholds in order to assign a Precipitation Category which, in turn, may determine the Operational Mode of the radar, the Volume Coverage Pattern (VCP) in effect, the load of algorithms run by the system, and the number and type of products generated. However, as of ORPG Build 5.0, the PDF no longer determines the activation and deactivation of accumulation periods in the Precipitation Processing System (PPS) algorithms and products. That determination will now be made within the PPS, itself, by a somewhat analogous Rainfall Detection Function that operates upon the Hybrid Scan Reflectivity field generated by the Enhanced Precipitation Preprocessing (EPRE) algorithm. The EPRE algorithm includes a filter that eliminates sample bins deemed most likely to represent AP-induced clutter, based upon a determination made by the predecessor, Radar Echo Classifier (REC) algorithm. This bin-by-bin determination is viewed as a more reliable method of accounting for AP/clutter in the rainfall category determination process than the method of estimating the nominal clutter area used in the PDF.

3.11.2 Precipitation Detection Function and Nominal Clutter Area.

A common reason for the failure of one of the non-zero Precipitation Categories (see Section [3.11.2.2](#)) to be activated by PDF is because the NCA is set too high. To clear up any misconception about precipitation category determination and volume coverage pattern selection, here is a brief overview of the Precipitation Detection Function.

3.11.2.1 Precipitation Detection Function (PDF). The PDF is designed to automatically determine if precipitation is occurring within 124 nm of the radar. After computing the areal coverage of reflectivities above a certain intensity (the Rate Threshold), the PDF compares this coverage to the Area Threshold which is the sum of the Precipitation Area Threshold and the Nominal Clutter Area Threshold. The PDF does not discern between a ground return and a real precipitation target. The NCA is intended to account for the areal coverage of residual clutter. See [Figure 3-24](#) to view the Precipitation Status screen displaying the Rate Threshold and Area Threshold.

Precipitation Status - (FAA:1)					
<div style="display: flex; justify-content: space-between; align-items: center;"> Close Modify Parameters </div>		<div style="display: flex; justify-content: space-between; align-items: center;"> Time Until Clear Air: 0 minutes </div>			
Detection Algorithm Executed: Feb 22, 2001 - 16:22:32 UT					
Category: LIGHT (2)		Time Last Detected:			
Current:		LIGHT (2):		Feb 22, 2001 - 16:22:32 UT	
		SIGNIFICANT (1):		Feb 21, 2001 - 20:17:53 UT	
Elevation Rate (dBR) Ref1 (dBZ) Area (km2) Precip					
Angle	Thresh	Thresh	Thresh Detect	Category	Met
0.5	-2.0	22.2	120	356	LIGHT (2)
0.5	-2.0	22.2	120	356	LIGHT (2) YES
0.5	4.0	30.6	160	101	SIGNIFICANT (1) NO
1.5	-2.0	22.2	120	0	LIGHT (2) NO
1.5	4.0	30.6	160	0	SIGNIFICANT (1) NO
2.4	-2.0	22.2	100	1	LIGHT (2) NO
2.4	4.0	30.6	160	0	SIGNIFICANT (1) NO
3.4	-2.0	22.2	100	0	LIGHT (2) NO
3.4	4.0	30.6	160	0	SIGNIFICANT (1) NO

NOTE: Threshold Area = Nominal Clutter Area + Precipitation Area

Figure 3-24. Precipitation Status

3.11.2.2 Precipitation Categories. One of the following three Precipitation Categories is assigned each volume scan depending on which combination of thresholds are met or exceeded:

- Category 0 - No precipitation detected. The total area of reflectivities ≥ 22 dBZ (≥ 30 dBZ) *did not* meet or exceed the Area Threshold for Category 2.
- Category 1 - Significant precipitation detected. The total area of reflectivities ≥ 30 dBZ *did* meet or exceed the Area Threshold for Category 1.
- Category 2 - Light precipitation detected. The total area of reflectivities ≥ 22 dBZ *did* meet or exceed the Area Threshold for Category 2.

By setting the NCA to represent the residual clutter, Categories 1 and 2 will be assigned by the PDF when real precipitation is occurring anywhere within 124 nm of the radar. In order to correctly set the NCA, the detected area of reflectivity returns can be checked on the Precipitation Status window. (Click on Precipitation Detection and the Precipitation Status window opens.) For example, on a precipitation-free day with no Anomalous Propagation (AP), the detected area is a good first guess for a typical NCA setting for your site. This window provides the results from the PDF for each volume scan, including the currently assigned precipitation category and the time left until the operator may select a Clear Air Mode volume coverage pattern.

3.11.2.3 Volume Coverage Pattern (VCP). When Category 1 has not been detected during the past hour, any VCP can be selected. When the assigned Category is 1, the radar can only be operated in Precipitation Mode (VCP 11 or 21). In either case, whether the precipitation algorithms will actively accumulate precipitation is based on the Rainfall Detection determination made within the PPS, itself, not the Precipitation Category, or the VCP selected.

3.11.2.4 Suggested Strategy. Here is a suggested strategy that still allows the user the flexibility to control the operational mode.

The NCA should not generally be used to prevent the radar from switching into Precipitation Mode A due to the presence of AP. AP should be filtered by the application of clutter suppression. If appropriate clutter suppression cannot properly remove all of the AP and the decision is made to increase the NCA to prevent the radar from switching into Precipitation Mode A, then the user should only increase the value of NCA for Category 1 (line 2 in the example window). Category 1 is the only category that requires a Precipitation Mode VCP. Thus once the residual AP has dissipated, the NCA for Category 1 must be promptly returned to the proper smaller residual clutter value to permit the radar to switch to Precipitation Mode when significant rainfall begins.

Never increase the values of NCA beyond the residual clutter value for Category 2. In the event of AP with NCA for Category 2 set to proper low values, the precipitation algorithms will execute as expected and automatically remove the negative effects of anomalous propagation on the precipitation estimates through quality control logic internal to the algorithms.

In the event that precipitation is accumulating (based upon the Rainfall Detection Determination within the PPS) during a very light rain or snow event, it may be desirable to maintain radar operations in a Clear air mode VCP. In this case, it is permissible under URC guidelines to raise the NCA threshold value for Category 1 precipitation, but leave it set relatively low for Category 2 precipita-

tion. If this is done, the Precipitation Rate and Area Thresholds will be exceeded for Category 2, but will not be exceeded for Category 1. Any VCP can be invoked while the precipitation products are accumulating rainfall estimates.

The user has direct control over the NCA settings. This allows flexibility in selection of the Precipitation Category and, hence, the Operational Mode and the VCP enacted. Once the rainfall condition has been determined by the Rainfall Detection function within the PPS, the user may wish to control the NCA settings so as to achieve an Operational Mode and VCP suitable to the meteorological condition (e.g., light rain or snow; heavy, convective rain, etc.)

3.11.3 Nominal Clutter Area Adjustments.

Each site has unique needs as to the use of Clutter Suppression Regions vs. Nominal Clutter Area adjustments. Some sites increase the NCA area to extremely high values (sometimes termed as “forced Clear Air” mode) to account for clutter and AP. However, there is an impact on the base data estimates and these actions could affect other users. With the software now fielded, there are very few legitimate reasons for making adjustments to the NCA. Below is a discussion about Clutter Suppression and Nominal Clutter Area, and then a discussion about impacts of these items at sites.

3.11.3.1 Clutter Suppression. Clutter suppression is used to remove the power returned by clutter targets from a range bin prior to the calculation of the base data.

Ground clutter contamination has a significant effect on the accuracy of the base data. The clutter induced bias in the base data not only brings into question the reliability of the data presented on the base products but also has a detrimental effect on all downstream algorithms.

Clutter suppression filters are designed to reduce signal power whose mean radial velocity is at or near zero. To do this, clutter suppression filters reduce signal power within a “notch width” centered about the zero mean radial velocity value. This reduction in signal power effectively decreases the clutter's power contribution in the given range bin. To maintain meteorological return integrity, only the signal power whose radial motion falls within the notch width is reduced. Therefore, with appropriate clutter suppression invoked, the bias in the base data (R, V and SW) estimates due to clutter contamination within the range bin can be minimized.

3.11.3.2 Nominal Clutter Area. The Nominal Clutter Area (NCA) (in km^2) value is used by the Precipitation Detection Function to account for the total areal coverage of residual ground clutter within 124 nm of the RDA. (Residual ground clutter is the non-meteorological signal that remains after clutter filtering.) The NCA plus the Precipitation Area determine the areal threshold that must be exceeded for Category 1 (significant precipitation) or Category 2 (light precipitation). NCA is the only adaptable parameter on the Precipitation Detection Screen that may be changed under URC level of authority. All others are under ROC level of change authority.

3.11.3.3 Anomalous Propagation Impact. The correct way to prevent non-meteorological returns from triggering a switch from Clear Air to Precipitation Mode is to apply clutter suppression regions. Increasing the nominal clutter area to force the system to stay in clear air mode with the development of AP will still allow the clutter to contaminate the base data and all downstream products and algo-

rhythm output. In some cases, aircraft operations have been negatively impacted by the appearance of AP on Reflectivity-based products.

Any intermittent non-meteorological returns must be removed via clutter suppression regions!

3.11.3.4 Light Precipitation Impact. Rainfall may be accumulating during a light precipitation or snowfall event due to the determination of the Rainfall Detection function of the PPS. In this event, it may be desirable to select Clear Air Mode (category 2), which may be accomplished with proper settings. This is intended only for light precipitation, which is defined by the default parameters of the Precipitation Detection Function. The default parameters for light precipitation are reflectivities equaling or exceeding 22 dBZ (but less than 26 dBZ) over an area of at least 100 km². (This minimum area can be set to as much as 80,000 km², which covers about 44% of the 124 nm coverage area). In qualitative terms, Clear Air Mode is appropriate in conjunction with rainfall accumulations occurring during light rain or snow events. There have been cases of convection occurring while the radar was in Clear Air Mode, so the user must be cautious in this situation.

The user could (under URC guidelines) increase the NCA for category 1 only, allowing the system to remain in Clear Air Mode with category 2. This may be appropriate in some marginal events, but the decision should be coordinated with the RFC. Forecasters need to understand that rainfall estimates built from 10 minute sampling intervals will have higher errors than estimates from 5 to 6 minute sampling.

For most events, if reflectivities meet or exceed 26 dBZ over 90 km² or more, then the default criteria for significant precipitation have been detected, and the system should be allowed to switch to Precipitation Mode.

Appendix A

Operating Function Overview

A.1 OPERATIONAL MODES.

The principal users (DOC, DoD, and DOT) have a common requirement for weather radar data on a continuous basis. Therefore, for any radar providing weather radar data to more than one principal user, one of the basic operational requirements is that the RDAs/RPGs be operated continuously, 24 hours a day, in predefined scanning modes and provide a set of data and products which have been approved by the user agencies. The principal users define the modes of operation of the WSR-88D System. These operational modes are a function of the weather conditions, season, and location of the radar. During operations, the antenna is controlled by automatic scanning programs. Different volume coverage patterns, which are matched to the operational mode, are available to optimize the product generation for the particular type of weather situation. The use of different volume coverage patterns and meteorological algorithm groupings is governed by strict interagency protocol whenever two or more agencies are using the weather information generated by the site (in the case of DoD, interagency agreements are established for each site). For any operational mode, radar scanning is continuous, in time, to support the various needs of the users. Any exception to continuous scanning requires the concurrence of all principal users. Operational procedures are established and agreed to by the principal users for automatic control of the changeover to the precipitation scanning mode at various sites. At all times, principal users' units are informed of the radar scanning program in use through the use of system status and product header data. There are two currently defined operational modes of operation which are used to acquire the meteorological data necessary to detect the weather and translate the results into products. These products are displayed at the principle user functional area to allow the user to make quick and accurate judgments on the impact of the detected weather on any operation being monitored. The operational modes are Clear Air Mode and Precipitation Mode. Clear Air Mode can only be selected manually. Precipitation Mode can be selected manually at any time and is also selected automatically whenever the Precipitation Detection Function (PDF) detects precipitation (based on pre-determined values and area coverage of reflectivity dBZ).

Note that whether the algorithms of the Precipitation Processing System (PPS) are actively accumulating precipitation is now determined by an analogous, Rainfall Detection function within the PPS, itself, which operates upon the Hybrid Scan rather than directly upon base reflectivity data. The PPS Rainfall Detection function essentially yields two rainfall conditions - Raining and Non Raining, while the still-operational PDF yields three Precipitation Categories - Significant, Light and None. These two functions will usually, but not always, yield the same result as to whether or not it is presently "raining". If they do not, it may be desirable, in some circumstances, for the user to manually select an Operational Mode consistent with the rainfall condition. For example, if the PPS is presently accumulating precipitation but the Operational Mode is Clear Air, the operator may want to change the mode to Precipitation to allow the PPS to benefit from its faster scanning rates (5 to 6 minutes vs. 10 minutes). On the other hand, if the PPS is not presently accumulating rainfall but the Operational Mode is Precipitation, the operator may want to change the mode to Clear Air so as to benefit from its more accurate base data estimates and its greater

sensitivity to detection of phenomena such as atmospheric moisture or density gradients (as explained below).

A.1.1 Clear Air Mode.

Clear Air Mode is oriented toward the gathering of data which will facilitate the detection of precursors to the development of precipitation activity. There are certain variabilities in low level velocity and air density that may be detected to give clues to precipitation activity development. The radar is operated at a relatively slow scan rate which allows the sampling of five contiguous elevation angles (0.55 to 4.55) in a period of ten minutes. This slow rotation rate coupled with a low Pulse Repetition Frequency (PRF) offers high sensitivity (range of dBZ starting from approximately minus 30 dBZ up to plus 20 dBZ or greater) and maximum detection capability. Weather phenomena normally monitored in this mode are associated with possible precipitation development (noted in clear air velocity measurements and atmospheric moisture or density gradients at low levels, which may be observed as reflectivity gradients). The number of algorithms that are exercised in this mode is significantly less than those in Precipitation Mode. Clear Air Mode is the least demanding in terms of RPG utilization and PUP product receipt and display activity. Clear Air Mode provides high sensitivity to subtle changes in atmospheric conditions at long range. This mode is used when there is little or no convective activity in the range of the radar and is employed to detect possible precursors to heavy weather and precipitation. To achieve this, the WSR-88D uses a volume coverage pattern that employs a slow scan rate of .84 RPM. This permits the antenna to dwell for a longer time in any given volume of space and accumulate more returns, allowing operation at a lower S/N ratio. In this mode, a wide pulse width of approximately 4.7 μ sec and a low PRF (from 320.51 Hz to 451.81 Hz) may also be used. It provides about 8 dB greater echo power for a given dBZ of reflectivity. The long pulse width forces lower PRF, which results in longer unambiguous range and a low Nyquist velocity. Clear Air Mode employs a low-elevation volume coverage pattern, ranging from 0.55 to 4.55. When the WSR-88D detects precipitation it automatically switches out of Clear Air into Precipitation Mode. There is also a short-pulse Clear Air Mode which is used in regions of high spectral width. The short-pulse mode has advantages at high Nyquist velocities (over 25 ms⁻¹). Its disadvantage is less sensitivity.

A.1.2 Precipitation Mode.

Precipitation mode has a scan rate that is partially dependent on the number of elevation angles used to sample the total radar volume. Four volume coverage patterns (VCPs) are used in Precipitation Mode. The VCPs provide sampling of 14 elevation angles in 4.1 or 5 minutes or 9 elevation angles in 5 or 6 minutes. Weather phenomena normally monitored in this mode are associated with the development of precipitation involving convective storms (rain showers, hail, severe thunderstorms, tornadoes, etc.) and large scale synoptic systems. A significant number of meteorological algorithms make use of the base data of reflectivity, velocity, and spectrum width to generate derived products (display of meteorological phenomena in direct terms). For Precipitation Mode, nearly all the algorithms are exercised and a maximum load is imposed system wide on data processing and product distribution. Currently, these algorithms are applied equally in all areas of the United States (U.S.), but eventually they may be tailored to geographic areas and seasons of the year. The Precipitation Mode is the most demanding in terms of communications,

RPG utilization for product generation, and product display. In Precipitation Mode, the scan rate is increased to allow a greater number of elevation angle scans within the volume scan update time. The scanning strategy enables contiguous scanning from the base antenna tilt setting up to an elevation angle of 19.5 degrees. Precipitation Mode provides a faster scan rate to monitor a larger volume of space in a shorter time. This permits the tracking of rapidly moving meteorological phenomena found in convective weather patterns. This mode is characterized by the use of a narrow pulse width (1.57 m sec) at both high and low PRFs, and the use of unique scan rates (from 1.89 to 5 rpm) at specific elevations.

A.1.3 Mode Characteristics.

Each operational mode as defined within each volume coverage pattern consists of unique sets of characteristics that specify waveform, range of PRF, product generation, and product request lists.

A.1.3.1 Volume Coverage Patterns (VCPs). In order to implement the operational modes, the WSR-88D employs a set of pre-defined VCPs to collect radar data. Each VCP is composed of specific antenna scan patterns and specific transmitted waveforms with corresponding default PRFs.

A.1.3.1.1 Scan Pattern. The scan pattern is made up of a set of "elevation cuts." Each elevation cut is a single full rotation of the antenna (in azimuth) at a discrete elevation angle. Depending on the VCP being used, elevation angles may have more than one elevation cut. In turn, multiple elevation cuts at the same elevation angle employ different waveforms or PRFs. In the case of different PRFs the Multiple Pulse Repetition Frequency Dealiasing Algorithm (MPDA) is required with the MPDA VCP. In the case of different waveforms each of two rotations is called a "split cut." Corresponding to each cut is a specified scan rate. The scan rate, the speed at which the antenna turns, is constant for the entire cut. Elevation cuts are divided into approximately one-degree radials. Radar data is accumulated for processing on a radial-to-radial basis. The exact width of the radials depends on the antenna scan rate, the PRF, and the exact number of pulses of transmitted waveforms specified for the radial, however, design practice strives for 365 radials per each 360.5 degree cut. Elevation angles of cuts are based on an antenna beam width of 0.955. VCPs 11, 12, 21, and 121 are used for Precipitation Mode. VCP 32 is normally used for clear air, although an optional Clear Air Mode, 31, provides long pulse.

A.1.3.2 PRI Patterns. The Pulse Repetition Interval (PRI) pattern is linked to the transmitted waveforms that correspond to the elevation cuts of the scan pattern in a particular VCP. The transmitted waveforms are composed of discrete numbers of RF pulses, where PRF is defined within each radial of a cut. The PRI designates available PRFs by a numeral ranging from 1 to 8. The pulses within each radial may or may not be evenly spaced, but the waveform pattern will repeat from radial to radial within each cut. The pulse width is constant over the entire volume scan. Waveforms are characterized into three different categories or groups; Contiguous Surveillance (CS), Contiguous Doppler (CD), and Batch (B).

A.1.3.2.1 Contiguous Surveillance. Contiguous Surveillance (CS) waveforms use a long pulse repetition interval and are range-unambiguous over the full coverage range of the radar (at least 460 km). CS is used at low elevation angles where maximum clutter suppression is needed. The

long pulse interval provides good reflectivity data and echo power data that is used to resolve the range ambiguities of Doppler waveform data.

A.1.3.2.2 Contiguous Doppler. Contiguous Doppler (CD) waveforms use a shorter pulse repetition interval and have fewer velocity ambiguities than the surveillance waveforms. The short pulse interval is used at low elevation angles to generate mean radial velocity and spectrum width base data. The shorter pulse interval is also used at high elevation angles where it is range-unambiguous to the maximum coverage altitude (data is only processed to 70,000 feet) to generate reflectivity, velocity, and spectrum width base data. Doppler waveforms also allow maximum clutter suppression.

A.1.3.2.3 Batch Waveforms. Batch (B) waveforms, used at mid-elevations, combine alternating groups of surveillance (long PRI) and Doppler (short PRI) pulses. Radial velocity, spectrum width, and reflectivity data are obtained, as other waveforms do. The long PRI pulses provide unambiguous range echo power data that is used to resolve the shorter PRI pulses. Shorter PRI pulses are better suited to provide velocity data. The batch waveform allows poor clutter suppression but can cover a volume in about 15 percent less time than required by a combination of contiguous surveillance and contiguous Doppler cuts. Batch waveforms are formed from one, or a combination of, PRIs from a set of 8 discrete values. There are five variant "delta" PRIs for each of the eight basic pulse repetition intervals. The deltas are provided as a way to minimize pulse interference between radars. A particular delta PRI set is assigned to each specific site through the adaptation data. The PRIs within each set are indexed from 1 to 8 and labeled PRI 1, 2, 3, etc. PRI 1 is range unambiguous over 460 km and is used primarily for surveillance. PRI 2 is range-unambiguous to 330 km. It is used for surveillance at slightly greater elevation angles and for Doppler waveforms with long pulse widths. PRIs 3 and 4 are used for surveillance, particularly with batch waveform types at intermediate elevation angles. PRIs 5 through 8 are used for Doppler waveforms at all elevation angles. The particular Doppler PRI used is selectable to minimize loss of data through the overlaying of range-ambiguous signals. Tables A-1 through A-5 give the pulse repetition period data for each delta PRI set.

A.1.3.3 Scan Strategies. Multiple scan strategies are available for use in performing the WSR-88D mission. These scan strategies are embodied in various volume coverage patterns (VCPs) which are designed to optimize performance for agency usage under specific meteorological conditions. VCPs consist of various combinations of scan rate, waveform, volume coverage period, and number of elevation cuts. VCP 12 and 121 were added after the initial deployment of the WSR-88D. Other VCPs may be added later. Typically, surveillance and Doppler waveforms are combined at low elevation angles where maximum ground clutter suppression is required. Batch waveform types are used at the intermediate elevations where ground clutter is less severe to avoid the need for multiple antenna revolutions at each elevation angle. Doppler waveform types are used at the higher elevation angles where the Doppler PRIs are range unambiguous.

Table A-1. Pulse Repetition Period Data Delta A

PRI #	PRI clocks	Period μ sec.	PRF	Ra KM
1	29440	3066.7	326.09	460

Table A-1. Pulse Repetition Period Data Delta A

PRI #	PRI clocks	Period μ sec.	PRF	Ra KM
2	21248	2213.3	451.81	332
3	14720	1533.3	652.17	230
4	11072	1153.3	867.05	173
5	9344	973.3	1027.40	146
6	8640	900.0	1111.11	135
7	8000	833.3	1200.00	125
8	7360	766.7	1304.35	115
Constants T	2880	300.0	3333.33	45

Table A-2. Pulse Repetition Period Data Delta B

PRI #	PRI clocks	Period μ sec.	PRF	Ra KM
1	29632	3086.7	323.97	463
2	21376	2226.7	449.10	334
3	14848	1546.7	646.55	232
4	11136	1160.0	862.07	174
5	9408	980.0	1020.41	147
6	8704	906.7	1102.94	136
7	8064	840.0	1190.48	126
8	7424	773.3	1293.10	116

Table A-3. Pulse Repetition Period Data Delta C

PRI #	PRI clocks	Period μ sec.	PRF	Ra KM
1	29824	3106.7	321.89	466
2	21504	2240.0	446.43	336

Table A-3. Pulse Repetition Period Data Delta C

PRI #	PRI clocks	Period μ sec.	PRF	Ra KM
1	29824	3106.7	321.89	466
3	14912	1553.3	643.78	233
4	11200	1166.7	857.14	175
5	9472	986.7	1013.51	148
6	8768	913.3	1094.89	137
7	8128	846.7	1181.10	127
8	7488	780.0	1282.05	117

Table A-4. Pulse Repetition Period Data Delta D

PRI #	PRI clocks	Period μ sec.	PRF	Ra KM
1	29952	3120.0	320.51	468
2	21632	2253.3	443.79	338
3	14976	1560.0	641.03	234
4	11264	1173.3	852.27	176
5	9536	993.3	1006.71	149
6	8832	920.0	1086.96	138
7	8192	853.3	1171.88	1268
8	7552	786.7	1271.19	118

Table A-5. Pulse Repetition Period Data Delta E

PRI #	PRI clocks	Period μ sec.	PRF	Ra KM
1	30144	3140.0	318.47	471
2	21760	2266.7	441.18	340
3	15104	1573.3	635.59	236
4	11328	1180.0	847.46	177
5	9600	1000.0	1000.00	150
6	8896	926.7	1079.14	139
7	8256	860.0	1162.79	129
8	7616	793.3	1260.50	119

A.1.3.3.1 Scan Strategy 1. Scan Strategy 1 is implemented in "convection" VCPs. Volume scan times are currently either 4.1 minutes using VCP 12 or 5 minutes using VCP 11. Both VCPs have 14 unique elevation-scan levels from 0.5 to 19.5 degrees. The primary difference between VCP 11 and VCP 12 is the vertical spacing at lower elevation angles. Differences between the lower elevation angles of VCP 11 are one (3 dB) beamwidth (0.9-1.0o), while those of VCP 12 are one-half (3 dB) beamwidth (0.4-0.5o). The more closely spaced lower elevation angles of VCP 12 have a pronounced effect on the identification of storms at middle and far ranges from a radar. VCP 12 provides the greatest amount of meteorological base data and improves upon the design of VCP 11 for use during severe convection.

A.1.3.3.2 Scan Strategy 2. Scan Strategy 2 is to be used with "shallow precipitation" events. Currently implemented in VCP 21, it provides a volume scan time of six minutes. It consists of nine unique elevation scan levels from 0.5 to 19.5 degrees. The lowest four degrees of elevation have no gaps between the one-way 3 dB points of adjacent elevation scans. As compared to Scan Strategy 1, VCP 21 sacrifices volume coverage, but the longer dwells afforded by the lower scan rates provide better clutter cancellations and slightly better base data estimates.

A.1.3.3.3 Scan Strategy 3. Scan Strategy 3 provides essentially contiguous volume coverage to 5 degrees elevation in 5 elevation cuts with a volume scan time of 10 minutes. The primary use is in non-precipitation conditions. Scan Strategy 3 is currently implemented in VCP 31 and 32. VCP 31 uses long pulse width (4.5 msec) transmitted pulses which restricts the maximum PRI number to 2. It uses only the contiguous surveillance waveform and Doppler waveform types and, consequently, has the best clutter suppression and the best sensitivity of the available volume coverage patterns. VCP 32 uses a short pulse width (1.5 msec).

A.1.3.3.4 MPDA Scan Strategy. The Multiple Pulse Repetition Frequency (PRF) Dealiasing Algorithm (MPDA) Scan Strategy provides a short-term software solution to reduce range folded

data and improperly dealiased Doppler velocity data. MPDA VCPs are designated by a 100-series number followed by the 2-digit number of the VCP with similar elevation angle pattern. The MPDA Scan Strategy is currently implemented in VCP 121, thus, elevation angles match VCP 21. VCP 121 provides a volume scan time of five minutes. The MPDA activates in the RPG only when an MPDA Scan Strategy is being used.

A.2 RADAR DATA PROCESSING MODES.

A.2.1 Base Data.

Base data is acquired using either the surveillance (reflectivity) channel, or the Doppler (velocity) channel of the radar. Each radar channel is associated with unique transmitted energy waveforms and receiver signal processing methods to achieve the desired data detection capabilities. Each type of processing is associated with certain limitations relating to range and velocity ambiguity to determine the useful operational range and elevation scan of the selected processing mode.

A.2.2 Surveillance Channel Waveforms.

The surveillance (reflectivity) channel waveforms use a long PRI and produce data which is range-unambiguous to 460 km. Doppler channel waveforms use a shorter PRI, and the Doppler channel unambiguous range is limited.

A.2.3 Surveillance PRI Waveforms.

Surveillance PRI waveforms are used at lower elevation cuts (scans), where maximum clutter suppression and unambiguous range are provided. Doppler PRI waveforms are used at high elevation angles, where second-time-around echoes are not a factor, i.e., Doppler PRIs are range-unambiguous. Surveillance and Doppler PRI waveforms are also alternated in a "split cut" at low elevation angles. Batch waveform processing, which consists of interleaved surveillance and Doppler PRIs, are used in intermediate elevation scans to provide resolution (dealiasing) of both range and velocity ambiguities.

A.2.4 Range Unfolding.

Range unfolding is accomplished by using data gathered from a Surveillance cut to determine whether data received at that azimuth on a Doppler cut is overlaid by signals from a different range interval, and if not, determines the correct range interval for the range sample. Velocity dealiasing is accomplished using an algorithm in the RPG which uses data from multiple radials to correctly dealias the wind data.

A.2.5 Time Series Data Array.

During the listening time of a single PRI, the analog portion of the WSR-88D receiver produces analog In (I) and Quadrature (Q) video. This I and Q video contains the amplitude and phase data of the return echo. The I and Q video is then sampled at a rate equivalent to 250 meter intervals (approx. 1.66 μ sec). This sampling establishes the maximum range resolution of the WSR-88D

radar. Each 250 meter interval is called a Range Resolution Cell. A Range Sweep is defined as all the range resolution cells sampled during a single PRI. A radial range bin is defined as all the range cells sampled in successive range sweeps at a single range for one radial. The radial thus consists of M sweeps indexed by the sweep number m in time sequence from 0 to M. Each sweep is divided into N range resolution cells, indexed from 0 to N-1 in order of increasing range-cell number n. Spacing between cells is at a range resolution of 250 meters. To get the spatial sense of this concept, refer to Figure A-1. Each I and Q video sample is converted to a discrete 12-bit binary word (one for I and one for Q) in an A/D converter and sent to a prescaler. The prescaler adjusts the magnitude of each sample, to compensate for attenuation inserted by the AGC circuits of the analog portion of the receiver, and converts the data to a floating point format having 6-bit exponent and 12-bit significant. This format can support the full dynamic range of the radar. The output of the prescaler is processed in a clutter filter to suppress ground clutter that appears at low elevation cuts. The output of the clutter filter is called time-series data or samples. The time-series samples are similar to the output of the A/D converters inasmuch as they are composed of individual packets of digital data representing the voltage of the I and Q video for each range cell in each sweep. The time-series array is an accumulation of the time-series samples stored for one radial in the input memory of the PSP. The structure of this array in memory is shown in Figure A-2. Two time-series arrays are present in the Batch Waveform mode of operation. Both arrays are of similar structure as described in the preceding paragraphs of this section, but of different sweep and resolution cell numbers. First of the two is the Surveillance Time-Series array; it results from time sampling within a low PRF pulse group. The second is called the Doppler time-series array; it results from sampling at a higher PRF pulse group. Figure A-3 illustrates the physical relationship between the two arrays. In order to get a physical sense of the radial time-series array, consider a single range bin within a radial. The bin is composed of a range cell containing I and Q data deposited by each sweep in the radial at the range bin in question. All the data in this range bin is used quantitatively to derive a single set of base data values unique to that range bin in that radial in the elevation cut under investigation. Thus, the minimum volume of space that can be rezoned is the width of one radial with a depth of 250 meters and a height of the radar beam width.

A.2.6 Echo Return Processing.

RF Echoes (reflected RF) received by the WSR-88D radar are processed to produce weather related information in the form of three basic parameters: reflectivity, mean radial velocity, and spectrum width.

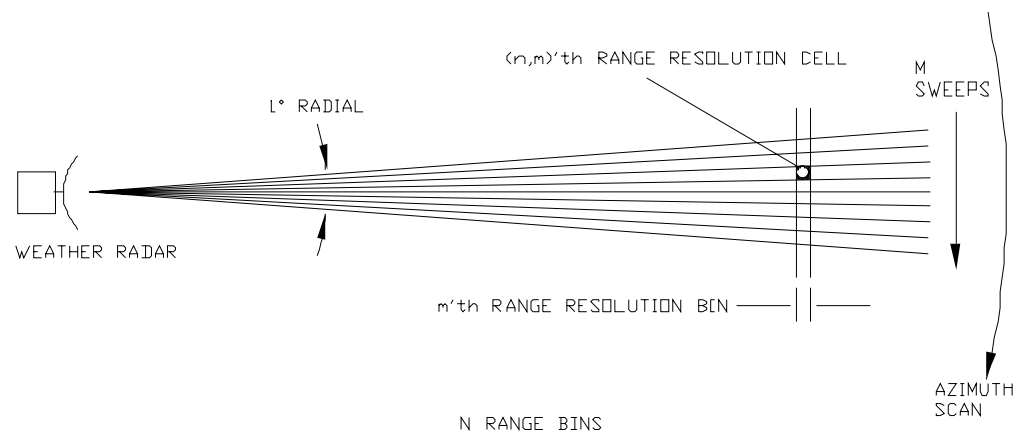
A.2.6.1 Reflectivity. Reflectivity is a measure of how well meteorological objects (clouds, rain, dust, etc.) reflect RF energy. It is calculated by normalizing the received echo power with the attenuation of space encountered at the range of the echo and with receiver gain calibration term. The space attenuation has two terms: one is the attenuation due to square law dispersion of the reflected RF from the target, and the other is the attenuation of the atmosphere as a function of range. The echo power is the average power of the time-series samples taken over all the range cells in 4 adjacent range bins. The echo power is stored in a one dimensional matrix called the echo-power array. This array has one value for each range bin in a radial. It should be noted that the power associated with the time-series samples in each range cell is proportion to the square of

the time-series sample magnitude. The reflectivity is a function of the composition and density of an object and is independent of its range. The reflectivity is given in units of dBZ.

A.2.6.2 Mean Radial Velocity. Mean radial velocity is the speed (inbound or outbound) of some object along the line of sight of the radar antenna. It is calculated by measuring and averaging the rate of change in phase of the return echo between adjacent sweeps in each range bin of a radial. (Strictly, the argument (i.e. the phase) of the auto correlation function of the returned signal is used instead of the phase difference being averaged since it is a more accurate estimator.) This average phase rate is scaled to vary between $+.5$ and $-.5$ instead of $+180^\circ$ and -180° . The phase is then multiplied by the Nyquist velocity which is inversely proportional to the PRF being used. The results are classified as ambiguous velocity since it is possible that the W phase could have rotated an entire 360° between sweeps before being sampled. A series of cross checks are performed to unfold ambiguous velocities. The velocity of a cell is compared to that of adjacent cells, initially in range, the presumption being that the velocity change between cells will not exceed half the Nyquist velocity. If it does, then the velocity is incremented by a Nyquist interval to measure the difference. Cross checks are performed in azimuth to help ensure consistency in the unfolded velocity field. If the velocity is determined after testing to be accurate, it becomes the unambiguous velocity and is used as such.

A.2.6.3 Spectrum Width. Spectrum width is a measure of the velocity deviation of particle velocities within a range bin of a radial. It is indicative of the air turbulence and the range of velocities within the volume of space defined by a radial range bin. The estimate of spectrum width is calculated using echo power and the magnitude of the auto correlation function calculated when estimating mean radial velocity.

P



NOTE: THE NOMINAL RADIAL WIDTH IS $\frac{360}{365}$ DEGREES

Figure A-1. One Degree Radial Scan in Azimuth for Contiguous Surveillance and Contiguous Doppler Waveforms

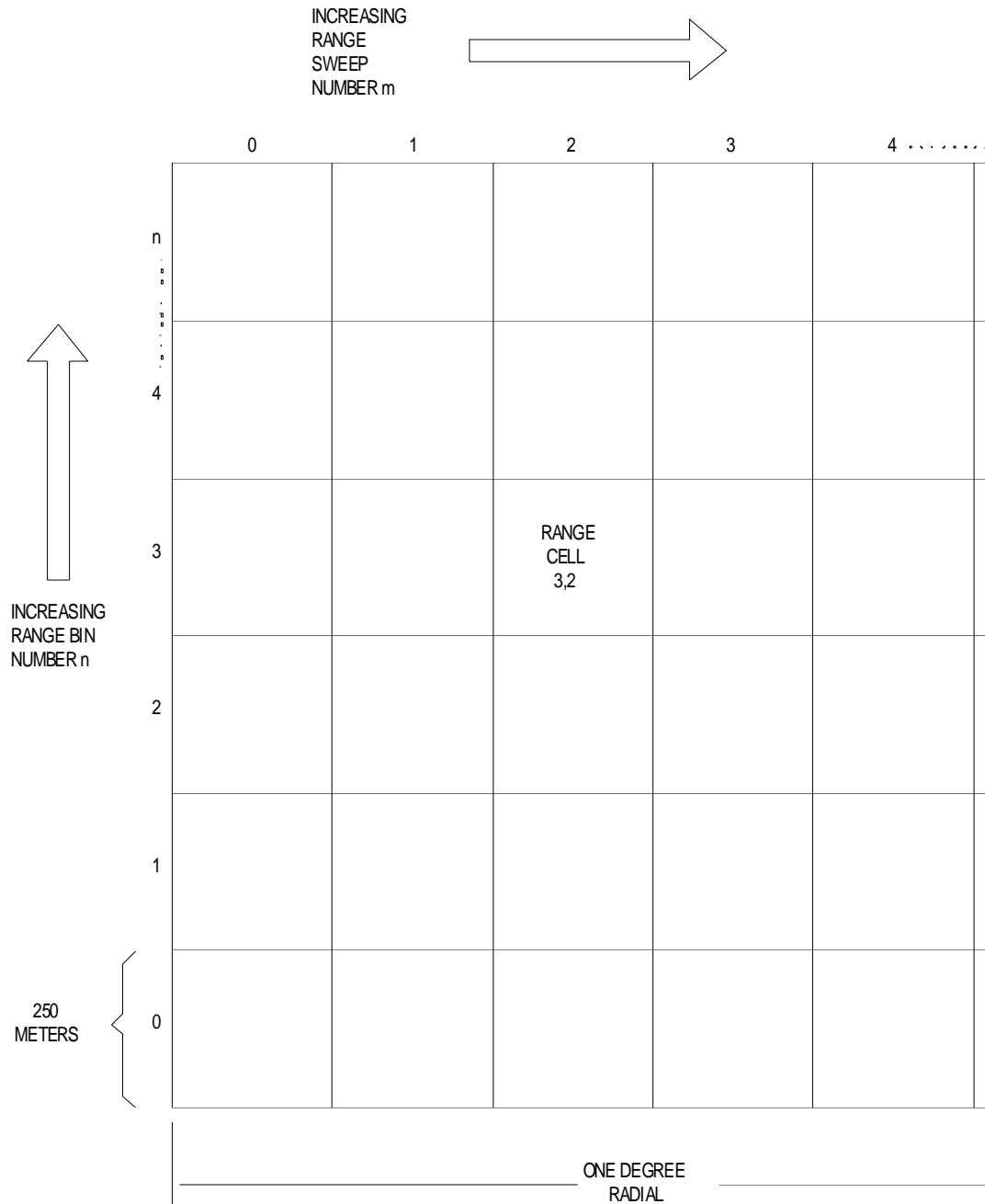
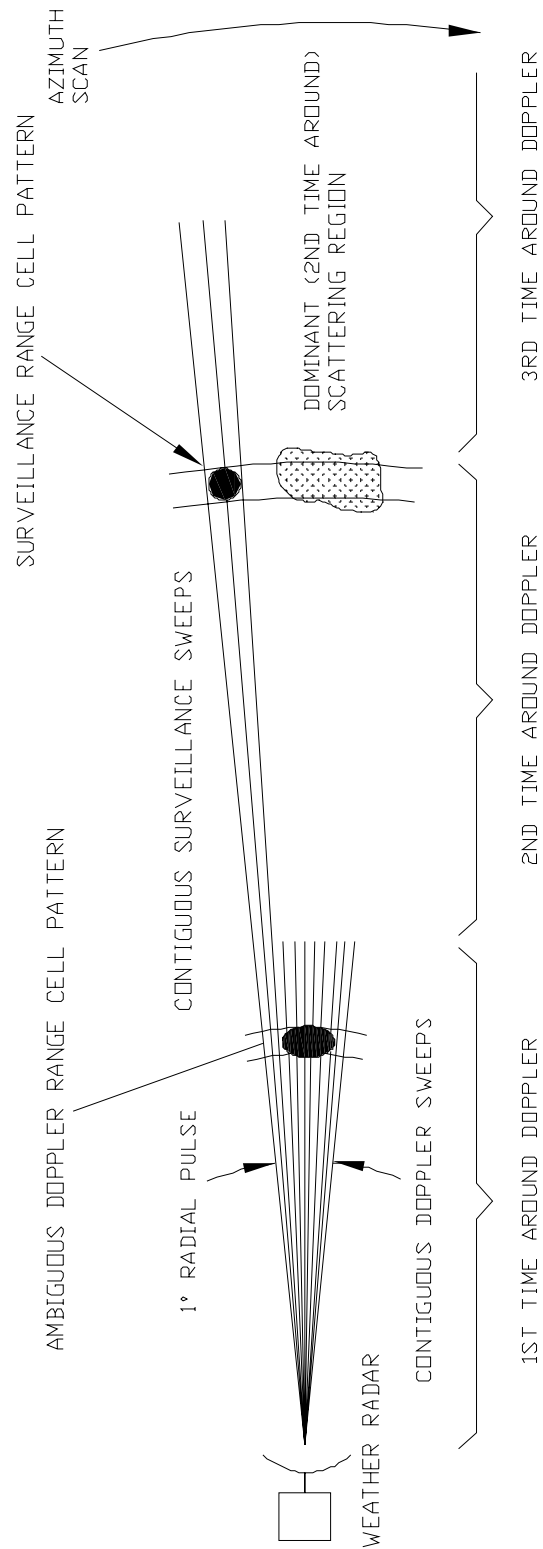


Figure A-2. Time Series Array Storage Format



DOPPLER RETURN CORRESPONDS TO ONE OR MORE POSSIBLE SURVEILLANCE RANGE CELLS - SECOND TIME AROUND IS DOMINANT IN THE ABOVE SITUATION.

Figure A-3. Resolution of Contiguous Doppler Ambiguity

A.3 PRODUCTS.

A.3.1 Base Products.

Base products consist of reflectivity, mean radial velocity, and radial velocity spectrum width presented for display on the color monitors at the workstation. The base products and azimuth coverage areas in kilometers (km) are listed below:

- Reflectivity - 0-230 km
 0-460 km
- Mean Radial Velocity - 0-60 km
 0-115 km
 0-230 km
- Spectrum Width - 0-60 km
 0-115 km
 0-230 km

The display of the base products is discussed in paragraphs [A.3.1.1 Reflectivity \(R\)](#) through [A.3.1.3 Spectrum Width \(SW\)](#).

A.3.1.1 Reflectivity (R). This product provides the reflectivity data displayable as an image. Variations of the product are organized to provide various areas of coverage and display resolutions. The product can be generated for any azimuth scan at a single elevation angle based on user requirements. Each scan is updated once per volume scan time. Each product is available for both 8 and 16 reflectivity data levels. Each product includes annotations for the product name, radar ID, time and date of scan, data level code, elevation angle, maximum data value (dBZ), radar position, radar elevation above Mean Sea Level (MSL), and radar operational mode.

A.3.1.2 Mean Radial Velocity (V). This product provides the mean radial velocity data displayable as an image. Variations of the product are organized to provide various areas of coverage and display resolution. The product can be generated for any azimuth scan at a single elevation angle based on user requirements. Each scan is updated once per volume scan time. Each product includes both 8 and 16 mean radial velocity data levels. Each product includes annotations for the product name, radar ID, time and date of scan, data level code, elevation angle, maximum data value detected (knots, positive and negative), radar position, radar elevation above MSL, and radar operational mode.

A.3.1.3 Spectrum Width (SW). This product provides the radial velocity spectrum width data displayable as an image. Variations of the product are organized to provide various areas of coverage and display resolutions. The product can be generated for any azimuth scan at a single elevation angle based on user requirements. Each scan is updated once per volume scan time. Each product is available for 8 spectrum width data levels. Each product includes annotations for the product name, radar ID, time and date of scan, data level code, elevation angle, maximum data value detected (knots), radar position, radar elevation above MSL, and radar operational mode.

A.3.2 Derived Products.

Derived products are described as those products generated within the RPG functional area that represent either some combination of base products or a base product that has been enhanced or otherwise changed by the use of manual or automated processing techniques. Derived products can be used for graphics of weather radar information or for further processing by a user.

The following paragraphs describe each of the derived products.

A.3.2.1 Combined Shear (CS). This product provides the combined (radial and azimuthal) shear of the mean radial velocity for a 230 km area centered at the radar position. The shear information presented in this product is the output of the Combined Shear Algorithm. It is presented as a displayable image of shear values containing 16 data levels. The capability of establishing the product resolution is a MSCF function. This product is produced for one elevation angle, as selected at the MSCF, with the lowest elevation angle as the default. This product is updated once per volume scan time. This product includes annotations for product name, radar ID, date and time of elevation scan, elevation angle, data level code, position and value of maximum shear value, radar position, radar elevation above MSL, product resolution and radar operational mode. Upon user request, all site-adaptable parameters identified as inputs to the algorithms used to generate data for this product are available at the alphanumeric display.

A.3.2.2 Composite Reflectivity (CR). This product provides composite reflectivity data displayable as an image. For each geographical resolution element, this product provides the highest reflectivity value above the resolution element available from any elevation angle scan of a volume scan. This product is updated once per volume scan time. The product is available for both 8 and 16 reflectivity data levels. The product includes annotations for the product name, radar ID, time and date of scan, data level code, maximum data value (dBZ), radar position, radar elevation above MSL and radar operational mode. In addition, storm information generated by the various meteorological algorithms, e.g., the Storm Series (SS) or Tornado Vortex Signature Algorithms, (TVSA) is included as annotations or graphic overlays, or both, as the user selects. When selected, the algorithm-generated information is provided for all identified storms. When these additional annotations or overlays are selected by the user, they are provided routinely until deselected. The information in these optional overlays and annotations is updated once per volume scan time.

A.3.2.3 Echo Tops (ET). This product provides the echo tops information displayed as an image. This product is produced from the output of the Echo Tops Algorithm. The product is updated once per volume scan time. The product is available for 16 altitude range data levels referenced to mean sea level. The product includes annotations for product name, radar ID, time and date of scan, maximum data value detected (Height in feet, MSL), radar position, radar elevation above MSL, and radar operational mode.

A.3.2.4 Severe Weather Analysis Display (SWR, SWV, SWW, SWS). This product provides, at the highest product resolution available, separate maps of reflectivity, mean radial velocity, spectrum width, and radial shear for 50 x 50 km areas. When produced because this product has been selected for generation due to the detection of an alert condition, the product is automatically generated for the elevation angle nearest the critical altitude for the meteorological phenomenon

causing the alert condition, and is centered at the coordinates of the meteorological phenomenon causing the alert condition. This product is also generated upon user request for a user-specified elevation angle and geographic center point. The capability exists to modify the mean radial velocity map by removing the storm motion of an operator-selected storm from the velocity data. The modified map is centered on the same geographic location as the original map. The method of removal is described in paragraph . The product contains 16 data levels for each data type displayed except spectrum width which contains 8 data levels. The product includes annotations for product name, radar ID, radar position, time and date of scan, Elevation angle, Height (AGL) of the phenomenon centerpoint, maximum data values detected, and any applicable alert mnemonic.

A.3.2.5 Severe Weather Probability (SWP). This product provides an alphanumeric set of severe weather probability values displayable in a graphic map format. These SWP values are produced using the SWP Algorithm. This product is updated each time the Vertically Integrated Liquid (VIL) product is updated. The product is produced in a form that can be used to generate an alphanumeric SWP value for overlaying the VIL image product or which can be displayed independently with the SWP value assigned to the VIL box corresponding to the center of an individual cell. Each product includes annotations for the product name, radar ID, time and date of volume scan which are used to produce the product, data level code, maximum data value detected (percent), radar position, radar elevation above MSL, and radar operational mode.

A.3.2.6 Velocity Azimuth Display (VAD) and VAD Wind Profile (VWP). This product provides the VAD Algorithm derived wind speed and direction. Two versions of the product are produced. For the first version, the wind speed and direction at up to 30 altitudes is computed and displayed as wind barbs on a height scale. The specific altitude levels at which VAD winds are computed and reported are site-adaptable in one thousand foot increments. The specific altitudes at which winds are requested are used to derive the specific slant range and elevation angle for the VAD algorithm analysis. Wind speed and direction is reported to the highest altitude level at which sufficient signal is available for processing by the VAD algorithm. The current and up to 10 previous height plots (user selectable) are displayed simultaneously on a time versus height scale. Altitude levels are shown referenced to mean sea level. This version of the product includes annotations for the product name, radar ID, radar position, radar elevation above MSL, time and date of volume scan, and maximum wind speed and associated direction of most current plot. Upon user request, all site-adaptable parameters identified as inputs to the algorithm used to generate data for this product are made available at the alphanumeric display. A second version of the VAD winds product is produced upon user request. This version presents the VAD wind analysis for a specific altitude. The data displayed consists of the Doppler velocity data used to compute the VAD wind and the best fit function used to determine the horizontal wind speed and direction. The data is presented to the user as a graphical plot for the actual Doppler velocity and the best fit function on an orthogonal axis of speed versus azimuth. The vertical axis presents speed, scaled as necessary to allow all data to be displayed. The Nyquist velocity for the specific scan is graphically annotated on the display if the range of the scaled vertical axis is sufficient. The horizontal axis is azimuth, scaled from 0-360 degrees with true north as 0/360 degrees. This product is made available for any wind value included in the most recent time-height cross-section version of the VAD Winds Product. This version of the product includes annotations for the product name, radar ID, radar position, radar elevation above MSL, time and date of volume scan, slant range,

elevation angle, wind speed and direction, computed altitude of winds, RMS error, and best fit function.

A.3.2.7 Cross Section (RCS, VCS). This product provides a vertical cross section of reflectivity or mean radial velocity data displayable as an image for a user-selected vector. This vector is defined by the operator using two end-points, up to 230 km apart, and at any orientation and location within 230 km of the radar. This product is produced by mapping the nearest value in range along a radial, to a point in the plane of the vertical cross section defined by the intersection of the plane and the radial. The displayable version of the product is produced by linearly interpolating between the mapped values, both horizontally and vertically as necessary. The product is generated only on request. The product is made available for both 8 and 16 data levels defining the intensity range and velocity range data levels, and 8 data levels only for spectrum width. The product includes annotations for the product name, radar ID, time and date of volume scan, maximum data value and location(s), radar position, radar elevation above MSL, and the radar operational mode. The location of the vector center and the end points (az/ran) is also indicated.

A.3.2.8 Storm Relative Mean Radial Velocity Map (SRM) and Storm Relative Mean Radial Velocity Region (SRR). This product provides mean radial velocity for the following: (a) a small geographic area centered upon or near an identified storm of interest with the storm motion removed, or (b) the entire area of radar coverage (to 230km) with the average storm motion removed. This product is produced upon request for any azimuth scan at any elevation angle. The product is generated as a displayable image by removing the radial (velocity component away from the radar antenna) component of storm motion from the mean radial velocity values. The radial component of storm motion is computed using the storm motion value computed for the identified storm by the Storm Tracking Algorithm, the vector average of all currently identified storms, or a value input by the user. The value of storm motion used to adjust the mean radial velocity values is user-selectable at the time of product request, or defaults to the vector average of all currently identified storms if not selected. Each product contains 16 data levels for storm-adjusted mean radial velocity. Each product includes annotations for the product name, radar ID, time and date of scan, elevation angle, storm motion, coordinates of product center, radar position, radar elevation above MSL, and radar operational mode.

A.3.2.9 Vertically Integrated Liquid (VIL). This product provides vertically integrated liquid values displayed as an image. The output of the VIL Algorithm is used to produce this product. The product is updated once per volume scan time. The product is available for 16 data levels. Each product includes annotations for product name, radar ID, time and date of volume scan, maximum data value (VIL value), radar position, radar elevation above MSL, and the radar operational mode.

A.3.2.10 Storm Tracking Information (STI). This product provides information concerning the past, present and future positions of each identified storm. This product is generated from the output of the Storm Tracking and Storm Position Forecast Algorithms. It is produced in a tabular format of alphanumeric values, as a standalone graphic product, and in a format for generating graphic overlays to other products. This product is updated once per volume scan time. Each product includes annotations for product name, radar ID, date and time of volume scan, maximum data value per storm, radar position, radar elevation above MSL, radar operational mode, and total

number of identified storms for which tracking is available. Upon user request, all site-adaptable parameters identified as inputs to the algorithm(s) used to generate data for this product are made available at the alphanumeric display.

A.3.2.11 Hail Index (HI). This product provides, for each storm identified by the storm series algorithms, an indication that the storm will or will not produce hail. The hail indication values that are shown for each storm are generated by the Hail Algorithm. This product is produced in a format that can be used to generate an alphanumeric tabular type of display, an alphanumeric annotation to other products, or a graphic overlay. This product is updated concurrently with the storm structure product. This product includes annotations for the product name, radar ID, time and date of last volume scan used to generate updated values, radar position, radar elevation above MSL, and radar operational mode. Upon user request, all site-adaptable parameters identified as inputs to the algorithm(s) used to generate data for this product are made available at the alphanumeric display.

A.3.2.12 Mesocyclone (M). This product provides information about identified shear and mesocyclone features. This product is generated from the output of the Mesocyclone Detection Algorithm. This product is generated in a format that can be used to generate an alphanumeric tabular display for any identified feature or all features simultaneously, a graphic display, or a graphic overlay or other products. This product is updated once per volume scan time. If on a particular volume scan there is no output from the Mesocyclone Detection Algorithm (i.e., no features of any type are identified), a version of the product is produced that exhibits the negative condition. This product includes annotations for the product name, radar ID, date and time of volume scan, radar position, radar elevation above MSL, and radar operational mode. Upon user request, all site-adaptable parameters identified as inputs to the algorithm(s) used to generate data for this product are made available at the alphanumeric display.

A.3.2.13 Tornado Vortex Signature (TVS). This product provides information regarding the existence and location of an identified TVS. This product is produced from the output of the TVS Algorithm. This product produces an alphanumeric tabular display of the algorithm output data for each identified mesocyclone and generates a graphic overlay of the TVS signatures information when such is identified. This product is updated once per volume scan time. This product includes annotations for the product name, radar ID, time and date of volume scan, radar position, radar elevation above MSL, and radar operational mode. Upon user request, all site-adaptable parameters identified as inputs to the algorithm(s) used to generate data for this product are made available at the alphanumeric display.

A.3.2.14 Storm Structure (SS). This product provides, for each identified storm, information regarding the structure of the storm. This product is produced from, and contain the values that are output by, the Storm Structure Algorithm. This product is updated once per volume scan time. This product is produced in a tabular alphanumeric format and includes annotations for the product name, radar ID, time and date of volume scan used to generate the latest set of values, radar position, radar elevation above MSL, and radar operational mode. Upon user request, all site-adaptable parameters identified as inputs to the algorithm(s) used to generate data for this product are made available at the alphanumeric display.

A.3.2.15 Layer Composite Reflectivity (LRA, LRM). Each product contains annotations for product name, radar ID, date and time of volume scan, maximum data value detected, radar position, radar elevation above MSL, and radar operational mode. All layer products are on a geographically based cartesian grid, centered on the radar. Up to three layers are available for layer products at each site; the depth of each layer is controlled via adaptation data. No layer is less than 6,000 ft. thick. Each layer product is updated on a volume scan basis. Eight data levels are available for each product, including one for data below the minimum threshold and one for no data. The default values for the reflectivity are the standard NWS DVIP levels, as defined in Federal Meteorological Handbook (FMH) #7. The data level thresholds are controlled via adaptation data. Before layering, the reflectivity data are thresholded with respect to mean noise level and are also filtered to remove spurious isolated data caused by point targets. It is possible to select either a maximum value or the average reflectivity for the grid box, but not both simultaneously. The range of coverage for each product is controlled via adaptation data; the default is a 460 km X 460 km square centered on the radar. A three-dimension (3-D) grid box is defined as the vertical projection of the geographically based cartesian grid square through the appropriate layer. All radar resolution volumes whose centers are contained in a given 3-D grid box are included in the computation for the 3-D grid box. All 3-D boxes whose centers fall in a radar resolution volume include the radar resolution volume in the computation for that 3-D grid box. A center that falls on a boundary is considered to fall on both/all sides of the boundary. The product resolution is 4 km X 4 km.

A.3.2.16 User Alert Message (UAM). This product provides a message of when a user adaptable selected threshold has been reached or exceeded. The message contains the location, type and severity of the weather event, and storm speed and direction of movement. The product is updated once per volume scan. The product includes annotations for the product name, radar ID, time and date of scan, radar position, radar elevation above MSL, and severe weather information as appropriate.

A.3.2.17 Radar Coded Message (RCM). The Radar Coded Message (RCM) is produced and made available from the RPG. The RCM is produced in 3 parts: Part A, Reflectivity; Part B, VAD Winds, and Part C, Remarks. These parts are combined into a single message ready for transmission. The specific data content of each part is described below.

A.3.2.17.1 Part A, Reflectivity. The pre-edit stage of Part A contains a graphic product and a tabular listing of alphanumerics. The graphic product contains reflectivity data for the 1/16 LFM grid over the radar area of coverage out to 460 km. The reflectivity intensity value for each grid box is determined by assigning the maximum value of all Composite Reflectivity boxes whose centers are contained within the 1/16 Limited Area Fine Mesh (LFM) grid square. The intermediate graphic product is based on the 16 level, 4 km X 4 km Composite Reflectivity Product but contains only 9 data categories: 6 for data within 230 km, 1 for missing or below threshold data within 230 km, and 2 for data beyond 230 km. The selection of which composite reflectivity levels map into which of the 6 radar-coded message categories is adaptable at the MSCF.

For data beyond 230 km, a separate adaptable threshold is provided for which:

- all data above that threshold are labeled as category 8, and
- all data below that threshold are labeled as category 9

The alphanumeric list contains the height (MSL) and position of the maximum echo top. The height, and the position where provided, are derived from the Echo Tops Product. The alphanumeric list also includes the location of the largest mass-ranked centroid within 230 km of the radar. The number of centroids reported are MSCF-adaptable from 1-20, with a default value of 12. Locations of these centroids is provided graphically by overlaying their respective storm identifiers on the intermediate graphic product. As available from the output of the Storm Position Forecast Algorithm, the forecast centroid speed and direction are also listed. The graphics and alphanumerics are formatted into part A of the radar-coded message.

A.3.2.17.2 Part B, VAD Winds. Part B of the radar-coded message contains a single profile of the horizontal wind information derived from the output of the VD algorithm.

A.3.2.17.3 Part C, Remarks. Part C of this product contains remarks in an alphanumeric format, consisting of meteorological algorithm-derived information. The information gives the position of each detected mesocyclone or uncorrelated shear feature (as derived from the Mesocyclone Detection Algorithm) and each detected TVS (as provided by the TVS Algorithm). In addition, for each centroid included in part A, part C contains the Hail Index (as provided by the Hail Algorithm) and the Storms Tops information (as provided by the Storm Structure Algorithm). This product is produced automatically up to 2 times per hour based on time of day specified at the MSCF in minutes after the hours. This product is also produced upon one-time request from the designated user using data from the last completed volume scan. For a continually scanning radar, the product is produced from the last completed volume scan prior to the scheduled time.

A.3.2.18 Free Text Message (FTM). This product provides a capability for defining an alphanumeric message for one-time transmission to specific WSR-88D Unit interface(s). The product is generated by an operator through the MSCF to the RPG's users. Messages may be designated to be transmitted to a specific or several WSR-88D Unit interfaces. Product includes radar ID, date, and time that the message was completed.

A.3.2.19 Surface Rainfall Accumulation (OHP, THP). These products provide a 1-hour and 3-hour rainfall accumulation maps displayed as an image. The 1-hour map is updated every volume scan time and the 3-hour map is updated once per hour. These products are available for 16 accumulated precipitation data levels. Each product includes annotations for the product name, radar ID, date and ending time (TSavgcur or clock hour as appropriate) of the rainfall rate integration, maximum data value, radar position, radar elevation above MSL, radar operational mode, the Gauge/Radar Bias in the radar estimate of the precipitation rate, and the effective number of Gauge/Radar pairs used in determining the bias estimate.

A.3.2.20 Storm Total Rainfall Accumulation (STP). This product provides a rainfall accumulation map displayed as an image. The product format and content are the same as the Surface Rainfall Accumulation Product except the time period is a variable and equals the period of continuous rainfall in the radar area of coverage. This product is updated every volume scan time. This product includes annotations for product name, radar ID, maximum data value detected, radar position, times and dates of the beginning and end (TSavgcur or clock hour as appropriate) of the rainfall rate integration, radar position, radar elevation above MSL, radar operational mode,

the Gauge/Radar Bias in the radar estimate of the precipitation rate, and the effective number of Gauge/Radar pairs used in determining the bias estimate.

A.3.2.21 Hourly Digital Precipitation Array (DPA). This product provides hourly running total digital radar-rainfall estimates in an array format (not display-oriented) to support processing performed external to the WSR-88D System. This product is updated once per volume scan time. The product is available for 256 data levels for each array element on a rectilinear, 1/40th LFM grid of nominal 4 km x 4 km resolution. Each product includes annotations for product name, radar ID, date and ending time (TSavgcur or clock hour as appropriate) of the rainfall rate integration, radar position, the radar operational mode, the maximum data value, the bias in the radar estimate of the precipitation rate (Bcur), and the error variance of the bias estimate (MSEcur).

A.3.2.22 Supplemental Precipitation Data (SPD). This product provides selected supplemental data and rain gauge/radar bias-related data generated or collected during the operation of the precipitation processing subsystem algorithms in a displayable, alphanumeric format. This product is updated once per volume scan time. This product includes annotations for product name, radar ID, date and time of volume scan, radar operational mode and volume coverage pattern, the number of sample bins rejected due to blockage or clutter and the highest elevation angle used during the building of the Hybrid Scan, the total area above the Rain Detection dBZ threshold, the full table of Biases received from AWIPS for various memory spans, the selected ("best") Bias from that table, and whether (Yes/No flag) it is presently being applied to the PPS accumulation products.

A.3.2.23 Digital Hybrid Scan Reflectivity (DHR). This product provides digital radar reflectivity values for the composite Hybrid Scan, assembled from low-level elevation angles and yielding a representative reflectivity value at every sample bin location of a 1 degree by 1 kilometer polar grid, out to a range of 230 kilometers (124 nautical miles). This digital data is provided to support processing performed by external systems and is not display oriented. This product will be updated once every volume scan time. This product is available for 256 data levels at each sample bin location. Each product includes a standard set of annotations, the hybrid scan date and time, and the maximum data value (dBZ) and its location.

A.3.2.24 Hybrid Scan Reflectivity (HSR). This product is a 16 data level version of the Hybrid Scan reflectivity product, derived from low-level elevation angles. Determination of which of the lower elevation angles is used at each azimuth and range location is based upon terrain-based Blockage data and AP/Clutter contamination-likelihood data. This product displays the reflectivity field that is used each volume scan in developing the precipitation products and the RCM. The HSR product can assist in assessing the accuracy of the precipitation products, searching for inconsistencies in the data, and discriminating between precipitation returns and ground returns due to anomalous propagation.

A.3.2.25 Layer Composite Reflectivity - AP Removed (APR). This product is an 8-data level reflectivity display similar in appearance to the existing Layer Composite Reflectivity Maximum (LRM) products. The APR product does not replace any of the existing LRM products. It is derived from the output of an algorithm which processes base reflectivity, velocity, and spectrum width data with the goal of distinguishing between meteorological returns and returns from

ground clutter/AP. The algorithm will generate a Surface to 24,000 ft Layer Composite Reflectivity Maximum product every volume scan with the algorithm-identified ground targets removed. The algorithm used to identify and remove clutter was developed at Lincoln laboratories, and is based on the observations that ground targets tend to affect mainly the lowest antenna tilts, and are typically associated with low radial velocity and low spectrum width.

A.3.2.26 Composite Reflectivity Edited - AP Removed (CRE). This product provides composite reflectivity data displayable as an image but with the effects of anomalous propagation removed. For each geographical resolution element this product provides the highest reflectivity value above the resolution element available from any elevation angle scan of a volume scan. This product is updated once per volume scan time. The product will be available for both 8 and 16 reflectivity data levels. The products includes a standard set of annotations, data level code, maximum data value (db) and its position, and product resolution. In addition, storm information generated by the various meteorological algorithms, e.g. the Storm Cell Identification and Tracking or Tornado Vortex Signature algorithms, will be included as graphic overlays. When selected the algorithm generated information will be provided for all identifies storm cells. When these additional overlays are selected, they will be provided routinely until deselected. The information in these optional overlays will be updated once per volume scan time.

A.3.2.27 ITWS Digital Base Velocity (DBV). This product is not a visual product but is digital only and is not sent to any standard user. This product provides a digital input of base velocity data comprised of 256 data levels in spherical coordinates. The product is generated for any elevation scan based on user requirements. Each scan is updated once per volume scan time. Each product includes a standard set of annotations, data level code, elevation angle, product resolution, identification of range obscured data, and other housekeeping information required to facilitate analysis, e.g., all data in the radial headers, synchronization, calibration, and other data required to interpret the base velocity data including antenna position, PRF, etc.

A.3.2.28 Clutter Likelihood Products. These products provide an image to the user showing where base data may be contaminated by ground clutter. The display will show a "percentage likelihood" base data contaminated by ground clutter. There are two products and each are elevation based. The product codes and mnemonics are described in the next two sub-paragraphs.

A.3.2.29 Clutter Likelihood Reflectivity (CLR). This product is requested like a base reflectivity product (example: Product 19), uniquely identified by the product code and elevation angle. The product code for the CLR is 132. It is displayed like other 4-bit run-length-encoded (packet code AF1F) products. The data levels are specified in the Product Spec ICD and are summarized as: 0 is "no data", code 1 is $\geq 0\%$, 2 is $\geq 10\%$, 3 is $\geq 20\%$, ..., 10 is $\geq 90\%$. The color scale emphasizes critical thresholds (generally, values less than 50 percent are not important.) The spatial resolution is 1 degree azimuth by 0.54 nmi (1 km), extending out to 230 km. This product has an alphanumeric portion which contains the adaptable parameters used by the Radar Echo Classifier, the algorithm that produces the Clutter Likelihood products. The message code for the alphanumeric portion is 110 for the CLR. The alphanumeric portion of the product is formatted similar to other products containing this feature (example: 1-hour rainfall accumulation, 3-hr rainfall accumulation).

A.3.2.30 Clutter Likelihood Doppler (CLD). This product is requested like a base reflectivity product (example: Product 19), uniquely identified by the product code and elevation angle. The product code for the CLD is 133. It is displayed like other 4-bit run-length-encoded (packet code AF1F) products. The data levels are specified in the Product Spec ICD and are summarized as: 0 is "no data", code 1 is $\geq 0\%$, 2 is $\geq 10\%$, 3 is $\geq 20\%$, ..., 10 is $\geq 90\%$. For the CLD, code 11 (hexadecimal B) is RF for range folded (like other Doppler products such as base velocity or base spectrum width.) The color scale emphasizes critical thresholds (generally, values less than 50 percent are not important.) The spatial resolution is 1 degree azimuth by 0.54 nmi (1 km), extending out to 230 km. This product has an alphanumeric portion which contains the adaptable parameters used by the Radar Echo Classifier, the algorithm that produces the Clutter Likelihood products. The message code for the alphanumeric portion is 111 for the CLD. The alphanumeric portion of the product is formatted similar to other products containing this feature (example: 1-hour rainfall accumulation, 3-hr rainfall accumulation).

A.3.2.31 Superob (SO). This product provides radial wind observations for NCEP models. It is generated once per hour and sent to AWIPS for transfer to NCEP. It is not displayable at the RPG nor at AWIPS. The product code is 136 and the mnemonic is SO. It contains an average of radial velocities within small azimuth-range sectors (called Superob cells) for each elevation angle. It is generated periodically (adaptable at the RPG), but the default is not expected to change. The initial default will cause generation once an hour at 30 minutes past the hour. The product size will be proportional to the amount of weather. Recent measurements using a widespread severe storm case revealed that the product can exceed 250K bytes. Starting with Build 2.0 of the RPG, there is an option to compress products using BZIP2. A compression of nearly 50% was demonstrated for SuperOb with the severe storm case cited above. If configured to be compressed, the RPG will leave the message header Block and Product Description Block unaltered. Flags will be set in the Product Description Block to denote that the product was compressed, the compression type, and the uncompressed product length. All product data following the Product Description Block will be compressed.

A.3.2.32 Digital VIL (DVL). This high resolution VIL product is intended for the FAA ITWS project. However, it may prove useful to NWS operations. The product code is 134 and the mnemonic is: DVL. It contains VIL data on a much higher spatial and data resolution than the current VIL product. Like the standard VIL (57) product, it is volume based. The product is in polar coordinates, uses packet code 16, and is formatted like other products already displayable on AWIPS (examples: DHR(32), DR(94), and DV(99)). The spatial resolution is 1 degree by 1 km, extending out to 460 km. The VIL data resolution is unusual in that it varies to emphasize low value VILS. It is an 8-bit (0-255) mapping that preserves resolution in low VIL (Mainly in values from 0.5 to 10 kg/m**2), but that gives no worse resolution in high VIL values than the current NEXRAD mapping (units of 5 kg/m**2) and covers the full range of VIL currently covered (0 to 80 kg/m**2).

The data levels are translated according to the following:

- Data level 0 is a VIL of less than 0.05 kg/m**2,
- Less than or equal to data level 18 is a VIL calculated by the equation

$$VIL=((data+5.1635)/123.2702).$$

- Greater than 18 is a VIL calculated by the equation $VIL=\exp((data-82.9028)/38.8763)$.

The product is large, roughly 164 Kbytes, and would benefit greatly with the BZIP2 compression if that option is employed by the FAA.

A.3.2.33 User Selectable Layer Composite Reflectivity Maximum (ULR). The User Selectable Layer Composite Reflectivity Maximum (ULR, Product 137) product gives users the ability to display the composite reflectivity maximums for a selected layer through a user request message. The user selects the bottom and top of the desired layer (in Kft), and the resulting product is a volume based final product for each user request. The algorithm can handle up to 10 user requests per volume scan. The final product is a 16 data level ICD formatted radial data message in polar coordinate presentation (360 radials X 230 km, with resolution 1 km X 1 degree). The ULR product is not selectable as a paired product.

Under the RPG Products, Product Generation, RPG Product Generation Table Editor, using the Current table, the user can preset default values and select the generation interval so the product can be generated routinely.

A.3.2.34 Digital Storm Total Rainfall Accumulation (DSP). The Digital Storm-total Precipitation (DSP, Product 138) product is a full-resolution (i.e., 256 data-level), digital version of the Storm Total product that can be used to determine accumulations for the duration of a storm event as well as discrete accumulations over short time periods (i.e., volume scan to volume scan). This product will provide better support to AWIPS applications, including Multi-sensor Precipitation Estimation (MPE) (WFO version) and Flash Flood Monitoring & Prediction (FFMP). The DSP will generate rainfall accumulations on a 2-km x 1-deg (115 x 360) polar grid in scaled, linear units. The basic output units are of .01" resolution, scaled as a function of the maximum data value in the output grid as follows: if the max data value is less than or equal to 2.55", the scaling factor (or increment between data values) is .01"; if the max data value exceeds 2.55" but is less than or equal to 5.10", the scaling factor is .02"; if the max data value exceeds (2 x 2.55") but is less than or equal to (3 x 2.55"), the scaling factor is .03"; etc. The DSP product will also generate an appended layer of ASCII data containing ancillary information such as present adaptation data settings and supplemental results determined during the algorithm processing. The DSP product is not selectable as a paired product.

A.3.2.35 Enhanced Echo Tops (EET). The Enhanced Echo Tops (EET) algorithm is intended to provide a higher fidelity echo tops product than is currently available from the legacy NEXRAD Echo Tops (ET) algorithm. It has improved spatial resolution as well as improved data level resolution. That, in combination with a mitigation scheme for the ripple seen in the current echo tops product, would yield a useful new product. Conceptually, the product would be interpreted in a similar manner as is the current echo tops product.

A.3.2.36 Mesocyclone Rapid Update (MRU). The NEXRAD system in the past did not produce updates of volume based products until a volume scan is completed. The Mesocyclone Rapid Update (MRU) capability will more quickly identify and assess the location and persistence of developing or ongoing Mesocyclone features.

The Mesocyclone Rapid Update (MRU) product is generated up to once per elevation scan. The MRU is generated based on data from the elevations that have been completed thus far in the current volume scan and is combined with Mesocyclone and Storm Track Algorithm data from the previous volume scan. SCIT motion of the cell associated with 3D features from the previous volume are used to derive forecast positions. If a cell motion is unavailable, the average motion is used. In feature-type order, the forecast position of each previous 3D feature is matched to closest current feature within a search radius defined by the SCIT algorithm. Current unmatched features are labeled "New".

Current features inherit attributes of the matched 3D feature (associated storm ID, feature type, maximum tangential shear and height of this shear, top height, base azimuth, base range, base height, azimuth diameter, range diameter). Position attributes (base azimuth, range, and height) of a matched feature are updated to the current detection. Position attributes of unmatched previous 3D feature are coasted to the forecast position. Strength attributes (feature type, maximum tangential shear) are updated to the current value if they increase in magnitude. If the maximum tangential shear is updated, the radial and azimuthal diameters and the height of the maximum shear are also updated. Updated attribute data will be identified. Product includes annotations for the product name, date and time of volume scan, and elevation angle. MRU can be used to generate a graphic display, overlay to other products, and alphanumeric displays.

A user will request the MRU product by specifying which elevations are desired. The user will either request a specific angle, how many of the lowest elevation scans, or all elevation scans. The elevation angle field of the product request will either specify an elevation scan or multiple elevation scans. That is, a decimal number (from -1.0 to 45.0) (with Elevation box empty) will indicate the closest elevation angle to provide the product. A decimal number with the Elevation box checked will include all elevations from that elevation down to the lowest elevation angle. An integer (-1 to -20) number will be used to specify products from the lowest scans: -4 will mean provide products from the lowest 4 elevation scans. Therefore, a single product request message can be used to obtain multiple products. The RPG will generate mesocyclone rapid update products according to default product generation list and user product requests and transmit the products to the requesting users.

The MRU will be on the RPG default generation list (all scans) in weather mode A, only. Alerting and replay product generation are not involved with this change. The product will closely resemble the format of the legacy mesocyclone product but with the following differences: a) In the graphic attributes table and the tabular alphanumeric table, the symbol ^ will follow any data that is updated; and b) The graphically displayed icons will distinguish between coasted and current mesocyclone and correlated shear features.

A.3.2.37 One Hour Snow Accumulation (OSW, OSD). These two products provide radar algorithm estimated 1-hour snow water equivalent (OSW) and snow depth (OSD) accumulation images. The products shall be updated every volume scan. The products shall be available for 16 data levels. Each product shall include annotations for the product name, radar ID, date, and ending time of the accumulation, type of range/height correction applied to the accumulation, maxi-

imum data value, azimuth and range of the maximum value, radar position, radar elevation above MSL, and radar operational mode.

A.3.2.38 Storm Total Snow Accumulation (SSW, SSD). These two products provide radar algorithm estimated storm total snow water equivalent (SSW) and snow depth (SSD) accumulation images. The products shall be updated every volume scan. The products shall be available for 16 data levels. Each product shall include annotations for the product name, radar ID, date, starting and ending time of the accumulation, type of range/height correction applied to the accumulation, maximum data value, azimuth and range of the maximum value, radar position, radar elevation above MSL, and radar operational mode.

A.3.2.39 User Selectable Snow Accumulation (USW, USD). These two products provide radar algorithm estimated storm total snow water equivalent (USW) and snow depth (USD) accumulation images for a user selected accumulation period. The product format and content shall be the same as the storm total snow accumulation products, except the accumulation period shall be of variable duration and in whole, top-of-the-hour clock hours. The products shall be updated at the top of every hour (as requested). The accumulation period shall be definable by the requestor via two parameters: the Ending Hour (ranging from 0 to 23Z) and the Time Span (ranging from 1 to 30 whole clock hours prior to the Ending Hour). The product will usually be generated by request, but may also be generated routinely for designated periods. The default accumulation period shall span a 24-hour period from 1200Z of the previous day to 1200Z of the present day.

A.3.2.40 Mesocyclone Detection (MD). This product is available at the end of each volume scan. This product provides tracking (past and future positions) of identified circulations. For a particular elevation angle, the Mesocyclone Detection Algorithm (MDA) searches for shear segments and convergence vectors. Compared to the legacy Mesocyclone algorithm, the MDA will detect a broader spectrum of circulations. If a 3D feature is matched for a number of volume scans, the past positions and forecast positions will be displayed. The past and forecast tracks apply only to the 3D feature. Circulations are tracked for up to 10 previous volume scans and up to six forecast positions are computed in 5 minute intervals.

A.3.2.41 Digital Mesocyclone Detection (DMD). This product is available each elevation angle. This product provides tracking (past and future positions) of identified circulations. For a particular elevation angle, the Mesocyclone Detection Algorithm (MDA) searches for shear segments and convergence vectors. Compared to the legacy Mesocyclone algorithm, the MDA will detect a broader spectrum of circulations. If a 3D feature is matched for a number of volume scans, the past positions and forecast positions will be displayed. The past and forecast tracks apply only to the 3D feature. Circulations are tracked for up to 10 previous volume scans and up to six forecast positions are computed in 5 minute intervals.

INDEX

Title	Page
A	
Acquire Radar Data Task	1-19
Acquire Rain Gauge Data Task	1-19
ACU	1-6
Adapt Times (FAA)	2-173, 2-212
Adaptable Parameters on FAA Channels	2-217
Adaptation Data	2-90, 3-11
Restoring	2-129
Saving	2-126
Adaptation Data Table	3-19
Add Dial-in User Button in PDCS Window	2-152
Add Precipitation Table Item Window	2-165
Additional RDA Status Information	2-73
AGC	A-9
Alarms Button in RDA Icon on HCI	2-74
Alarms Line	2-162
Alert/Threshold	3-11
Alert/Threshold Adaptation Data	2-90
Algorithms	2-123, 3-13
Alphanumeric Keys	2-19
Anomalous Propagation Impact	3-74
Antenna/Pedestal Performance Data	2-181
APC	1-13
Applications Icons	2-174
Archive II LDM Data Button Under RPG Icon	2-203
Archive Level II LDM Control Section	2-36, 2-203
Area Obscuration Table	3-17
Audio Alarms	2-173
Auto PRF Function	2-45
Auto PRF Toggle	2-170
Automatic Calibration	2-71
Automatic PRF Selection	3-24
Auxiliary Power Source	2-69
Azimuth Changes in Clutter Regions Window	3-50
B	
Back Space Key	2-21
Background Product for Clutter Regions	3-48
Backing Up Software	2-200
Backup of BDDS User Accounts Using tar	2-201
Backup of RPG or MSCF User Accounts Using tar	2-201
Base Data	2-203
Base Data Accuracy	3-56
Base Data Client Control	2-36

INDEX

Title	Page
Base Data Display	2-175
Base Data Distribution	2-203
Base Data Distribution Server (BDDS)	1-4, 1-5, 1-14, 2-36
Base Data Estimate Bias Due to Ground Clutter Contamination	3-51
Base Products	A-14
Baseline Restore/Update Buttons	2-159
BDDS	1-4, 1-5, 1-14, 2-36
BDDS User Accounts Backup Using tar	2-201
BDDS User Accounts Restoral Using tar	2-202
Buttons	2-10
Bypass Map (RDASOT)	3-54
Bypass Map Displays	3-47, 3-48
Bypass Map Editor	2-178, 3-59
Bypass Map in Control Using the Operator-Specified Notch Width	3-54
C	
Calib (Value) Auto/Manual	2-171
Calibration	2-70
Calibration Check Performance Data	2-183
Calibration Performance Data	2-182
Capital Lock	2-21
Category	2-169
CDE	2-2, 2-3, 2-196
CD-ROM	1-13
Cell Product	3-26
Cell Product Parameters	2-107
Centroid Count	3-34
Change Colors	2-193
Change Passwords	2-192
Change Passwords Window	2-192
Change to RDA VCP	2-46, 3-14
Changing Adaptable Parameters on FAA Channels	2-217
Channel Service Unit (CSU)	1-6
CISCO Router	2-30
CISCO Switch	2-28
Clear Air Mode	A-2
Staying in	3-57
Velocity Dealiasing Features	3-57
Clear Button	2-40, 2-77
Click and Drag Entries in Environmental Data	3-69
Clutter Contamination Impact on Meteorological Data Interpretation	3-51
Clutter Regions	2-178, 3-41

INDEX

Title	Page
Clutter Regions File Button and Files Window	3-43
Clutter Regions Window Title	3-42
Clutter Suppression	3-74
Clutter Suppression Regions	3-54
Appropriate	3-56
Filter	3-53
Management	3-58
Negative Impacts	3-56
None	3-54
Operator-Defined	3-54
Color-coding	2-11
Colors Button in HCI Properties Window	2-193
Common Desktop Environment (CDE)	2-3, 2-196
Comms Button in USERS Icon on HCI	2-144
Comms Status Button on MSCF	2-26
Comms Status Window on MSCF	2-28
Communication Server	1-5, 1-14
Composite Reflectivity and Obscuration Data Display Region	3-17
Computer Program Interfaces	1-19
Console Messages	2-189
Console Window	2-198
Consumables/Expendables	1-20
Contiguous Doppler (CD) Waveforms	A-4
Contiguous Surveillance (CS) Waveforms	A-3
Control Button in RDA Icon on HCI	2-61
Control Button in RPG Icon on HCI	2-83
Control System Tasks	1-19
Controls	2-3, 2-14
CPU Load Control	3-4
CSU	1-6, 1-14
Current VCP and Elevation Angle Display	2-44
Cursor Control Keys	2-20
Cursor Movement Keys	2-20

D

Data Entry Button in Environmental Data Editor Window	3-66
Data Range Button in RPG Base Data Display Window	2-176
Data Smearing	3-56
Decreased Velocity Dealiasing Failures in Clear Air Mode	3-57
Dedicated Adapter Panel	1-6
Dedicated Patch Panel and Patch Panel Expansion	1-6
Dedicated/Dial Modem Rack Assembly	1-5
Default Notch Width Map	3-54
Default Storm Motion	3-68

INDEX

Title	Page
Default VCP Mod	2-90
Default Weather Mode	2-89
Delete Button in Clutter Regions Window	3-50
Delete Dial-in User Button in PDCS Window	2-153
Delete Key	2-21
Delete Precipitation Table	2-168
Derived Products	A-15
Destinations Section in Console Messages Window	2-190
Detection Algorithm Executed in Precipitation Status Window	2-169
Device Section in RDA Alarms Window	2-76
Device Status Performance Data	2-184
Dial Adapter Panel	1-6
Dial Patch Panel	1-6
Dial-in Users Section in PDCS Window	2-150
Disk File Status Performance Data	2-185
Display - Products in Database	2-134
Distant MSCF	1-8, 2-2
Distribute Products Task	1-19
Distribution Load Shed	3-5
DOD and FAA MSCF Communications	1-15
DOWNLOAD VCP from RPG	2-46, 3-14
E	
Edit Window in Clutter Bypass Map Editor	3-62
Either RDA Control	2-68
Electronic Performance Support System (EPSS)	2-3, 2-219
Elevation Angle and Current VCP Display	2-44
Elevation Buttons in RPG Base Data Display Window	2-175
Elevation Range Modification in PRF Selection Window	2-50
Elevation Segment Area in Clutter Regions Window	3-50
Emergency Recovery Procedures	2-201
Enable RDA Control	2-67
Environmental Data	2-191, 3-63
Environmental Data Entry Window	3-66
Environmental Winds Data	3-67
EPSS	2-3, 2-219
F	
FAA and DoD MSCF Communications	1-15
FAA HCI	2-206
FAA LOCA Passwords	2-217
FAA MSCF	2-204
FAA Redundant Adaptable Parameters Match Adapt Times	2-173, 2-212
FAA Redundant Configuration	2-72

INDEX

Title	Page
FAA Redundant Control	2-72
FAA Redundant System	1-7
FAA Redundant System Control	2-204
FAA Remote Monitoring Subsystem (RMS)	1-7
FAA RMS Button in RPG Icon	2-140, 2-207
FAA Unique Hardware	1-15, 1-16
Failed Control Task List Window	2-138
Failed Task List Window	2-138
Feedback Line	2-162
Filter Buttons in RPG Base Data Display Window	2-178
Filter Parameters on RDA Alarms Window	2-76
Filter Product List Section on RPG Product Distribution Control	2-157
Find	2-40
First and Second Levels	3-37
Font Properties Window	2-193
Forced Clutter Suppression Using the Operator-Specified Notch Width	3-54
Front Panel	2-3
G	
Gage Bias Adjustment Toggle	3-40
Gateway	1-5
Gen Off or On Line	2-162
General Parameters Section in PDCS Window	2-148
Generate Products Task	1-19
Generated: Line in Clutter Bypass Map Editor	3-62
Generation List	2-94, 3-11
Get Status Button on RDA Control/Status Window	2-63
Graphical RPG Applications Software	2-7
Graphical User Interface (GUI)	2-3, 2-7
Graphics Utilization in Clutter Regions Window	3-47
Grid Buttons in RPG Base Data Display Window	2-178
Ground Clutter Impact on Meteorological Data Interpretation	3-51
GUI	2-3, 2-7
H	
Hail Temperature Heights	3-67
Hardware Functionality of RPG	1-4
Hardware Status/Warnings Section in MSCF Window	2-39
HCI	1-1, 2-7, 2-41, 3-3
FAA	2-206
HCI Operator Control	3-9
HCI Properties	2-191
Help with HCI	2-219

INDEX

Title	Page
Home Key	2-20
Human Computer Interface (HCI)	1-1, 2-7, 2-41, 3-3
Hydromet Adjustment Algorithm	3-40
I	
Icons	2-10
Incoming Messages in Console Messages Window	2-190
Indicators	2-11
Insert Key	2-21
Interference Suppression	2-69
IP	1-4
J	
JAZ Disk	2-245
JAZ Disk Removal	2-246
JAZ Storage Device	2-244
K	
Keyboard and Mouse	1-5
Keyboard Usage	2-18
Keyboard, Video, Mouse (KVM) Switch	1-5
L	
LAN Switch	1-4, 1-13
Last Download Time	3-47
Layer Product	3-28
Layer Product Parameters	2-113, 3-28
Left Mouse Button	2-22
Light Precipitation Impact in PDF Window	3-75
Line Control Buttons in PDCS Window	2-148
Line Management Section in PDCS Window	2-149
Line/User Info Section in PDCS Window	2-150
Load Baseline Button on Bypass Map Editor Window	3-60
Load Shed Categories	2-171, 3-4
Load Shed Products	2-101, 3-4
Load Shedding	3-4
Loading Software	2-200
Local Area Network (LAN) Switch	1-4, 1-13
Local MSCF	1-8, 2-2
Lock RMS Button	2-209, 2-211
Login/Logout procedures	2-195
Logout	2-198
Low Bandwidth	2-194

INDEX

Title	Page
Low/High Elevation Segment Clutter Suppression Definition	3-50
M	
Manual Calibration	2-71
Map Buttons in RPG Base Data Display Window	2-178
Master System Control Function (MSCF) Workstation	1-1, 1-4
Maximum Displayable Alarms on RDA Alarms Window	2-76
Mean Radial Velocity (V) Estimate	3-52, A-10
Menus	2-3
Message Filter in RPG Status Window	2-138
Microwave Line-Of-Site (MLOS)	2-59
Middle Mouse Button	2-24
MLOS	1-6, 2-59
MLOS Control Box	2-59
Mode: Zoom/Sector Selection in Clutter Regions Window	3-48
Mode Buttons in RPG Base Data Display window	2-178
Modem Rack Assembly	1-5
Modify Current VCP Data Window	2-53, 3-17
Modify Elevations Range in PRF Selection Window	3-17
Modify Precipitation Detection Parameters Window	2-165
Modify Precipitation Table Item Window	2-167
Modify VCP	2-47, 3-14
Modify VCP - Adaptation	3-19
Modify VCP - Current	3-15
Modify VCP Adaptation Data Window	2-54, 3-19
Moment Buttons in the RPG Base Data Display Window	2-178
Moments Button in RDA Control/Status Window	2-63
Moments window	2-63
Mouse	2-22
MPDA Scan Strategy	A-7
MSCF	1-1, 2-2
FAA	2-204
MSCF Applications Software Backup	2-201
MSCF Applications Software Restoral	2-201
MSCF Communications (FAA and DoD)	1-8
MSCF Equipment	1-8, 1-15
MSCF Printer	1-9
MSCF Terminal Suite	1-15
MSCF User Accounts Backup Using tar	2-201
MSCF User Accounts Restoral Using tar	2-202
MSCF Window	2-24
Multiple Editors / Multiple Edit Windows Open at the Same Time	2-194

INDEX

Title	Page
N	
Narrowband Communications	1-6, 3-3
Narrowband Communications Equipment	1-14
Narrowband Connections Graphics	2-143
Negative Impacts of Inappropriate, Operator-Forced Clutter Suppression	3-56
Network Connectivity in MSCF Window	2-40
No Clutter Suppression	3-54
Nominal Clutter Area	3-71, 3-74
Notch Width Map	3-54
Notch Width Selections	3-54
Numeric Keypad	2-21
NWS Communications	1-15
NWS Redundant System	1-7
NWS Redundant System Control	2-204
NWS Unique Hardware - Remote RDA Maintenance Terminal	1-16
O	
Obscuration Table in PRF Selection Window	2-50
OHP/THP Data Levels Parameters	2-119
Operational Computer Program Interfaces	1-19
Operational Modes	A-1
Operator-Defined Clutter Suppression Regions	3-54
Outgoing Messages in Console Messages Window	2-191
Overview of WSR-88D Clutter Suppression	3-54
P	
Padlock	2-12
Page Up/Page Down Keys	2-20
Password	2-12, 2-147, 2-155, 2-196
PDCS Window	2-144
PDF	3-71
Port Identifier	2-149
Power Administrator Masterswitch	1-4, 1-13
Power Control Button	2-34
Power Control Window	2-34
Precipitation Category (Precip Cat)	2-163, 3-73
Precipitation Detection Function (PDF)	3-71
Precipitation Mode	A-2
Precipitation Status Window	2-163, 2-169
PRF (Scan Strategy)	A-7
PRF Selection	2-45, 2-178, 3-23
PRF Selection (Modify Current VCP) Window	2-49, 3-21

INDEX

Title	Page
PRI Patterns	A-3
Print RPG Log Messages Window	2-140
Printer	1-9
Product Distribution Comms Status Window	2-144
Product Distribution Lines Section in PDCS Window	2-147
Product Storage Load Shed	3-9
Products Button in the RPG Icon on HCI	2-90
Products Button in USERS Icon on HCI	2-154
Products in Database	2-134
Products List in RPG Product Distribution Control Window	2-157
Pulse Repetition Interval (PRI) Pattern	A-3
R	
Radar Data Processing Modes	A-8
Radar Product Generator (RPG)	1-1
Radome	2-43
Top of	2-161
Range Changes in Clutter Regions Window	3-50
Raw/Zoom Mode Buttons in RPG Base Data Display Window	2-178
RCM Product	3-32
RCM Product Parameters	2-109
RCM Reflectivity Data Levels	3-35
RCM Reflectivity Data Levels Parameters	2-115
RDA Alarm Messages List	2-77
RDA Alarm Summary	2-58
RDA Alarm WIndow	2-139
RDA Alarms	2-58, 2-63, 2-74
RDA Control	2-61, 2-67
RDA Control/Status Window	2-61, 2-210
RDA Control/Status Window Redundant Control Adapt Times	2-212
RDA HCI Button on MSCF	2-36
RDA Icon on the HCI	2-42, 2-61
RDA Lock RMS Button	2-209
RDA Messages	2-173
RDA Offline Operate Button	2-67
RDA Operate Operate	2-66
RDA Performance Data	2-179
RDA Power Source	2-43, 2-68, 2-78
RDA Radial Load Shed	3-10
RDA Restart Button	2-66
RDA Standby Button	2-66
RDA State	2-65

INDEX

Title	Page
RDA/RPG Gateway	1-5
RDA/RPG Interface Control/Status	2-79, 2-81
Receiver/Signal Processor Performance Data	2-186
Redundant Control	2-204, 2-215
Redundant Systems	1-7
Reflectivity (Z) Estimate	3-52, A-9
Reflectivity Calibration Window	2-71, 2-72
Relay Box	1-7, 1-16
Remote Monitoring Subsystem (RMS) Power Administrator	1-7, 1-16
Remote RDA Maintenance Terminal	1-7, 1-16
Restart Elevation	2-58, 3-19
Restart VCP	2-58, 3-19
Restoral of BDDS User Accounts Made Using tar	2-202
Restoral of RPG or MSCF User Accounts Made Using tar	2-202
Restoring Adaptation Data	2-129, 2-130
Return key	2-20
Right Mouse Button	2-24
RMS	1-7, 1-16
RMS Button in RPG Icon	2-140, 2-207
RMS Free Text Message Window	2-142, 2-208
RMS Inhibit Time Window	2-142, 2-207
RMS Lock Button	2-209, 2-211
RMS Messages Window	2-141, 2-207
Router	1-5, 1-14
Router Card Status	2-32
RPG Alarm Summary in RPG Status Window	2-137
RPG Applications Software Backup	2-201
RPG Applications Software Restoral	2-201
RPG Base Data Display Window	2-175
RPG Control Window	2-84
RPG Data Processing	3-2
RPG Equipment Description	1-10
RPG Functionality	1-4
RPG Group Software	1-18
RPG HCI	2-35
RPG HCI Button on MSCF	2-35
RPG Human-Computer Interface (HCI) Controls	2-7
RPG Icon on HCI	2-83
RPG Lock RMS Button	2-211
RPG Mode	2-89
RPG Processor	1-4, 1-13, 3-2
RPG Processor/Communications Assembly (RPGPCA)	1-4, 1-13
RPG Product Distribution Control window	2-154
RPG Products Window	2-90

INDEX

Title	Page
RPG Radial Load Shed	3-10
RPG Restart	2-85
RPG Router	1-5, 1-14
RPG Shutdown	2-88
RPG Software Program (CPCI 03)	1-18
RPG Status	2-135
RPG System Control Block	2-85
RPG User Accounts Backup Using tar	2-202
RPG User Accounts Restoral Using tar	2-202
RPGPCA	1-4, 1-13
 S	
Save Button	2-158, 3-60
Saving Adaptation Data	2-126
Scan Button in RPG Base Data Display Window	2-175
Scan Strategies	A-4
Search Block	2-77
Search Date/Time Box in Product in Database Window	2-135
Second-Trip Velocity and Spectrum Width Data - Increased Availability	3-57
Security	2-222
Select Code in Clutter Regions Window	3-50
Select Product Box in Products in Database Window	2-135
Select Remote RDA Control	2-67
Selectable Parameters	2-104, 3-12, 3-25
Selection of Product Parameters	2-104, 3-12, 3-25
Set All Products Section in RPG PProduct Distribution Comms Status Window ..	2-156
Setting User Accounts	2-225
Shift Keys	2-21
Short-Haul Modem	1-6
Software Backup Using ufsdump	2-201
Software Description	1-18
Software Restoral Using ufsrestore	2-201
Sort Options in RPG Product Distribution Comms Status Window	2-147
Space Bar	2-19
Spectrum Width (W) Estimate	3-53
Status	2-162
Status Button in RPG Icon on HCI	2-135
Storage Device	1-5, 1-14, 2-244
STP Data Levels	2-121, 3-36
Suggested Clutter Suppression Management	3-58
System Backup	2-244

INDEX

Title	Page
System Log Messages in RPG Status Window	2-139
System Security Overview	2-222
System Software Backup Using ufsdump	2-201
System Software Restoral Using ufsrestore (Individual File System Example) ...	2-201
T	
Tab Key	2-20
TCP	1-4, 1-14
Text Strings on HCI	2-159
Third through Sixteenth Levels	3-37
Threshold and Detection Data in Precipitation Status Window	2-169
Time Last Detected: Light and Significant in Precipitation Status Window	2-169
Time Limit in PDCS Window	2-149
Time Until Clear Air in Precipitation Status Window	2-169
Top Row of Commands	3-65
Tower	2-44
Tower Utilities Performance Data	2-187
TPS	2-44
Transitional Power Source (TPS)	2-44
Transmission Control Protocol (TCP)	1-4
Transmitter Performance Data	2-188
U	
Undo Button	2-159
Uninterruptible Power Supply (UPS)	1-4, 1-13
UNIX Operating System	1-18
UPS	1-4, 1-13
User Accounts Backup Using tar	2-201
User Class Section in RPG Product Distribution Control Window	2-155
User Name	2-195
User Passwords	2-225
User Products	2-154
USERS Icon on HCI	2-143
Utility Power Source	2-69
V	
VAD and RCM Heights Parameters	2-111, 3-37
VAD Update	2-170, 3-65, 3-69
VCP Button	2-64
VCP Control Window	2-45, 2-64, 3-14
VCP Modification and PRF Selection	2-47, 3-15, 3-21, 3-23

INDEX

Title	Page
VCP Selection	2-56, 3-19
Velocity (V) Estimate (Mean Radial)	3-52, A-10
Velocity Data Levels	3-39
Velocity Data Levels Parameters	2-117
Velocity Dealiasing Failures in Clear Air Mode	3-57
Velocity Increment	2-50, 2-53, 2-56, 3-16
Velocity Interval	3-19
Volume Coverage Pattern	A-3
Volume Coverage Pattern (VCP) Changes and Automatic PRF Selection	3-23
Volume Coverage Pattern (VCP) Control Window	2-45, 2-64, 3-14
 W	
WAN	1-14
Warning Popups	2-11
Weather Surveillance Radar - 1988 Doppler (WSR-88D)	1-1
Wideband Communications	1-6, 3-3
Wideband Communications Performance Data	2-189
Wideband Connectivity	2-80, 2-82
Windows	2-3, 2-9
Workspace Menu	2-17, 2-197
Workspaces	2-3
WSR-88D	1-1
WSR-88D Clutter Suppression	3-54
 Z	
Zero Isodop Apparent in the Reflectivity Field	3-56
Zoom/Raw Mode Buttons in RPG Base Data Display Window	2-178

GLOSSARY OF TERMS

<u>Acronym or Non-Standard Term</u>	<u>Definition</u>
AC.....	Alternating Current
ACU	Automatic Call Unit
A/D	Analog-to-Digital
AF.....	Air Force
AGC	Automatic Gain Control
AGL	Above Ground Level
AP.....	Anomalous Propagation
APC.....	American Power Conversion
ASCII	American Standard Code for Information Interchange
B	Batch
BASRFLCT	Processing task which produces base reflectivity products
BASVLCTY	Processing task which produces base velocity products
Bcur.....	Current BIAS, the current multiplicative factor that adjusts for the radar bias when compared to surface precipitation measurements.
BDDS	Base Data Distribution Server
BYTE	8 Contiguous Bits
CD.....	Contiguous Doppler
CDE	Common Desktop Environment
CD-ROM	Compact Disc - Read Only Memory
CPCI	Computer Program Configuration Items
CPU.....	Computer Processing Unit
CS	Contiguous Surveillance/Control Store
CSU.....	Channel Service Unit
dB	Decibels
dBZ.....	Decibels of Rainfall Rate
dBZ.....	Decibels of Reflectivity
DAC	Discretionary Access Control
DIMM.....	Dual In-Line Memory Module
DOC	Department of Commerce
DoD.....	Department of Defense
DOT	Department of Transportation
dpi	dots per inch
DRAM	Dynamic Random Access Memory
DSP.....	Digital Storm Total Rainfall Accumulation
EPRE.....	Enhanced Precipitation Preprocessing
EPSS	Electronic Performance Support System
ET	Echo Tops
ETPRODD	Echo Tops product

GLOSSARY - CONT.

<u>Acronym or Non-Standard Term</u>	<u>Definition</u>
FAA.....	Federal Aviation Administration
FAS.....	Fault Alarm System
FFMP.....	Flash Flood Monitoring & Prediction
FMH.....	Federal Meteorological Handbook
GB.....	Gigabyte
GUI.....	Graphical User Interface
HCI.....	Human Computer Interface
I/O.....	Input/Output
ICD.....	Interface Control Document
ID.....	Identification
I&A.....	Identification and Authentication
ISU.....	Interference Suppression Unit
KB.....	Kilobyte (kilo = 1,024 Bytes)
Km.....	Kilometer
KVM.....	Keyboard / Video / Mouse
LAN.....	Local Area Network
LB.....	Low Bandwidth
LDM.....	Local Data Manager
LFM.....	Limited Area Fire Mesh
LOCA.....	Level Of Change Authority
MB.....	Megabyte (mega = 1,048,576)
MB/s.....	Megabits Per Second (mega = 1,000,000)
Mesocyclone.....	A 3-dimensional region in a storm that rotates (usually cyclonically) and is closely correlated with severe weather.
MHz.....	Megahertz
MLOS.....	Microwave Line of Sight
Mode A.....	Convective Mode (Precipitation/Severe Weather)
Mode B.....	Clear Air Mode
MPC.....	Multiple Peripheral Control
MPDA.....	Multiple Pulse Repetition Frequency Dealiasing Algorithm
MPE.....	Multi-sensor Precipitation Estimation
MPS.....	Multi-Protocol Server
MSCF.....	Master System Control Function
MSEcur.....	Mean Square Error (MSE) of current BIAS value.
MSL.....	Mean Sea Level
N/A.....	Not Applicable
NCA.....	Nominal Clutter Area
NCEP.....	National Center for Environmental Prediction
NTP.....	Network Time Protocol
NEXRAD.....	Next Generation Weather Radar
NWM.....	Notch Width Map

GLOSSARY - CONT.

<u>Acronym or Non-Standard Term</u>	<u>Definition</u>
NWS	National Weather Service
OS	Operating System
PDF	Precipitation Detection Function
ppm	pages per minute
PPP	Point-to-Point Protocol
PPP	Pulse Pair Processing
PPS	Precipitation Processing System
PRF	Pulse Repetition Frequency
PRI	Pulse Repetition Interval
PSP	Programmable Signal Processor
Q	Quadrature
RAM	Random Access Memory
RCM	Radar Coded Message
RDA	Radar Data Acquisition
RDASC	Radar Data Acquisition Status and Control
RDASOT	Radar Data Acquisition System Operational Test
REC	Radar Echo Classifier
RF	Range Folded
RFC	River Forecast Center
RMAX	Maximum Range
RMS	Remote Monitoring Subsystem
RMS	Root Mean Square
ROC	Radar Operations Center
RPG	Radar Product Generator
RPGOP	Radar Product Generator Operational Position
RPGPCA	RPG Processor/Communications Assembly
RPM	Revolutions Per Minute
SNMP	Simple Network Management Protocol
SNR	Signal-to-Noise Ratio
SPP	Staggered Pulse Pair
SPS	Signal Processor Subsystem
SS	Storm Structure
SSRAM	Synchronous Static Random Access Memory
STATMUX	Statistical Multiplexer
STI	Storm Track Information
SYNC	Synchronous
SW	Spectrum Width
SWP	Severe Weather Probability
TCP/IP	Transmission Control Protocol/Internet Protocol
TELCO	Telephone Company
TOVER	Range Unfolding Overlay Threshold in RDA SPS Adaptation Data
TPS	Transition Power Source

GLOSSARY - CONT.

<u>Acronym or Non-Standard Term</u>	<u>Definition</u>
TVS.....	Tornado Vortex Signature
TVSA	Tornado Vortex Signature Algorithms
UD.....	Unit Designation
ULR	User Selectable Layer Composite Reflectivity Maximum
UPS.....	Uninterruptible Power Supply
URC	Unit Radar Committee
UTC	Coordinated Universal Time
V	Velocity, Mean Radial Velocity
VAC.....	Volts Alternating Current
VAD	Velocity Azimuth Display
VCP.....	Volume Coverage Pattern
VI	Velocity Increment
VIL	Vertically Integrated Liquid
VILETALG.....	Processing task which produces volume-based products
VILPROD.....	Vertically Integrated Liquid product
WFO	Warning and Forecast Office
WSFO.....	Weather Service Forecast Office
WSR	Weather Surveillance Radar
WSR-88D	Weather Surveillance Radar - 1988 Doppler